Still need to be worked on

Translate inch to cm and adjust all sizes
Check building instruccion from Denis Scalin in the same folder and Shorten Build instruccion
Fill in missing numbers

Solar Dehydrator

Background

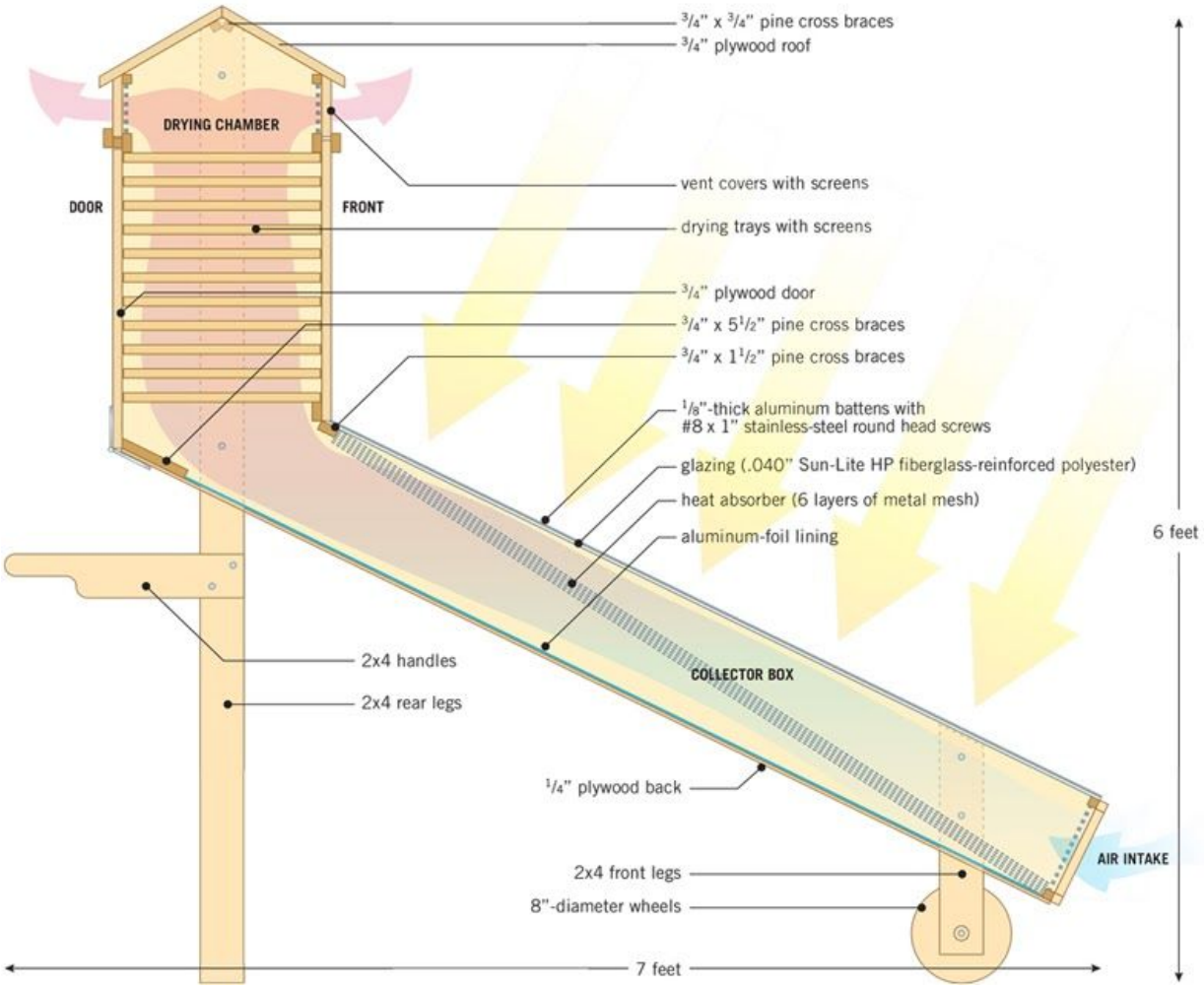
A solar food dehytrator is used to conserve fruits, vegetables, herbs, fish, meat and other food. By drying or dehydrating the food (reduce moisture content of food to 10 - 20%) bacteria, yeast, mold and enzymes are all prevented from spoiling it while the flavor and most of the nutritional value is preserved and concentrated. The solar dehydrator described in this article is an indirect, through-pass, solar food dryer, that operates simply by natural convection. It is constructed within 20-40 hours and by using mainly local materials this X-X tall solar dehydrator that can dry Xkg of fruits within 2 days is about XXX Dollars.

Working principle

The working principle of the upstram solar food dehydrator is based on three components: the collector box, where heat is collected, a drying chamber, where the food is stored and adjustable inlet and outlet vents, which assure an airstream from bottom to the top of the dehydrator.

and as warm air rises at the bottom To reduce the moisture content of food heat and air flow is needed. Therefore the dryer is composed of a collector box, where
This solar dehydrator is composed of a “Through Pass” collector at the bottom, where sunlight is absorbed and a drying chamber positioned above, where the food to be dried is stored. Adjustable inlet vents at the very bottom of the dehydrator allow “fresh air” to enter into the dryer, where it gets heated above a aluminium mesh absorber positioned diagonally under a glazing material. The heated air rises and thus passes through the the drying chamber, where it dehydrates the food and finally leaves the dryer through two adjustable outlet vents at the front and back on the very top of the dehydrater. The slight vaccum created through the natural convetion keeps the air circulation to be continued as long as sunlight drives the process.

photos from dehytator from front and back, probably with labeling of most important components



Dryer Construction *(try to plut on 2 pages to have good overwiev)*

Material list

The dryer consits mainly of economic, local materials. For the outer lining two exterior plywood panels are needed. . _Pine boardsXXX are used to support the strucutre at the most critical locations. For the absorption of radiation and the conservation of heat a metal mesh, insulating board, dark aluminum screening and a glazing is needed. A detailed list of all material and tools needed listed below.

“The dryer is primarily constructed of 3/4" exterior plywood, 1/4" exterior plywood, 3/4" celotex insulation board, dark aluminum screening, glazing, some 3/4" thick pine boards, and wood screws. The cutout illustrations (Illustration 3 & 4) dimension the layout of the important plywood and insulation pieces.”

Materials List
• One 122cm by 244cm sheet of 1.9cm thick plywood, exterior grade *(sides, vent covers and door)*
One 4-by-8-foot sheet of 3/4-inch plywood, exterior grade
• One 122cm by 244cm sheet of 0.635cm thick plywood, exterior grade (bottom, roof adn south wall)
One 4-by-8-foot sheet of 1/4-inch plywood, exterior grade
• Five (supporting outer lining at most critical places)
Five 1-by-6s, 8 feet long, pressure-treated
• Two
Two 2-by-4s, 8 feet long, pressure-treated
• 2 wheels, 20.32cm diameter
2 wheels, 8-inch-diameter
• 91.44cm long, 1.27cm diamter steel axle
36-inch-long, 1/2-inch-diameter steel axle
• 2 heavy-duty hinges
• Six 68.58cm by 243.84cm sheets of metal lath
Six 27-by-96-inch sheets of metal lath

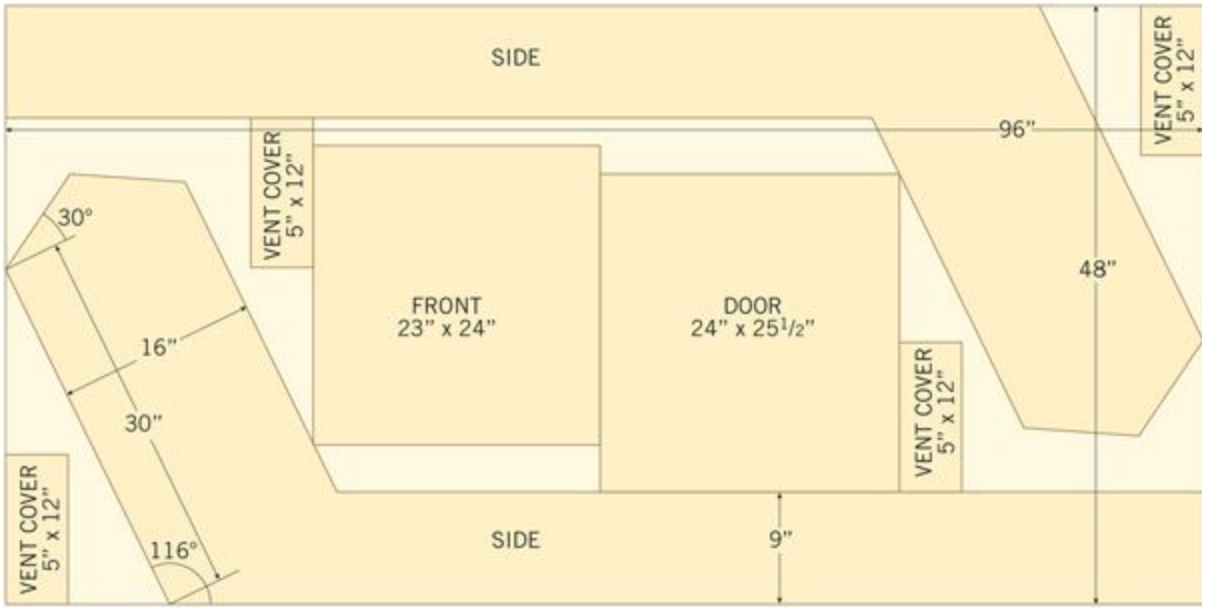
• 0.27m^2 aluminum screen
3 square feet aluminum screen
• One 60.96cm by 182.88cm sheet of FRP (fiber-reinforced plastic) (glazing)
One 2-by-6-foot sheet of FRP (fiber-reinforced plastic)
• 2.7m^2 food-grade screening (food trays)
30 square feet food-grade screening
• Heavy-duty aluminum foil, 762cm
Heavy-duty aluminum foil, 25-foot roll

• 1.9cm by 0.3175cm aluminum battens, 487.68cm total length
3/4-by-1/8-inch aluminum battens, 16 feet total length
•
1 1/4-inch No.8 exterior-grade Phillips flat-head screws (100 or more)
•
1 5/8-inch No. 8 exterior-grade Phillips flat-head screws (about 30)
•
1-inch No. 8 round-head screws (about 20)
• Eight 0.9525cm by 7.62cm bolts, nuts and washers
Eight 3/8-by-3-inch bolts, nuts and washers
• Four 0.9525cm by 10.16cm bolts, nuts and washers
Four 3/8-by-4-inch bolts, nuts and washers
• 4 hook-and-eye fasteners

• 0.635 cm staples
1/4-inch staples
• Exterior-grade latex paint and primer, any light color
• High-temperature spray paint, black
• Waterproof glue
• Silicone caulk
• Weatherstripping
• Shingles

Tools List
• Circular saw with rip guide
• Router with 3/4-inch straight bit and cutting guide
• Electric drill with No. 8 pilot-hole and countersinking bits
• 2 sawhorses
• Long straightedge
• Marking pencil
• Protractor
• Framing square
• Level
• Tape measure
• Staple gun
• Caulk gun
• Paintbrush
• Wrenches
• Tinsnips
• Utility knife
• Clamps
• Heavy work gloves

Step 1: Mark the Cutting Diagram
Mark the differnt parts of the solar dehydrator according the cutting diagram (Illustration 2) on the 122cmx144cm and 1.9cm thick exterior plywood.



Cutting Diagram

Most of the wood required for these solar food dehydrator plans can be cut from a single 4-by-8-foot sheet of three-quarters-inch-thick exterior-grade plywood. Measure and mark the plywood using the cutting diagram (above) as your guide. Note that the dryer sides are cut in a single piece so there's no joint between the collector box and the drying chamber. You should mark the dehydrator's sides on opposite edges of the plywood sheet to leave space in the center for the other pieces you'll need.

The angle of the sides on this design is perfect for drying food at 36 degrees latitude in North Carolina. The unit will function well anywhere, though, offering maximal performance between March 21 and May 21, and from July 21 to September 21. If you prefer your food dryer to have the best possible angle for your latitude, refer to the suggestions in Table 1 (below). Here's how

to transfer a customized angle to the plywood sheet: Measure and mark 13 inches in from the corner on the edge of one long side, place a protractor on the mark, find the correct angle for your latitude on the protractor, and draw that angled line up from the mark to the adjacent short edge of the plywood sheet. The length of this line should be 30 inches. If you measure the line and discover it's not 30 inches, move a straightedge to the right or left of the original line — and parallel to it — until you get a 30-inch-long line at the correct angle for your latitude, then mark the line again. Using the cutting diagram, measure and mark the remaining lines for both of the dehydrator sides, then fill in the empty space on the plywood sheet with lines for the vent covers and the front and back of the drying chamber.

Table 1: Dehydrator Angles for Different Latitudes

Latitude Degrees	Angle in Degrees
20	100
30	110
40	120
50	130
60	140

Step 2: Cut the Sides

Step 2

Place the marked sheet of three-quarters-inch plywood on top of two sawhorses and cut out the pieces using a circular saw. Be sure to cut straight lines because you want the dehydrator box to be airtight. Make plunge cuts when cutting out the angles of the drying chamber and roof for the dehydrator's sides. After cutting out the two large sides, lay one on top of the other and check to see if they're the same size and shape. If not, mark the areas that are different and trim the larger piece with a circular saw so that both sides match. Cut the remaining components from the plywood sheet, and prime and paint the interior and exterior of all wooden pieces to reduce warping which could create an air leak.

Step 3: Cut the Braces

Step 3

Before beginning assembly, you'll need to cut some braces to support the components of the solar dehydrator on the interior. Most of these braces will serve more than one function so it's important to use the correct one at each location. See the detailed drawing ("How it Works," above) for proper sizing and placement of the braces.

To make the braces, cut some three-quarters-inch-thick pine boards into strips using a rip guide on a circular or table saw. You'll need to cut the following sizes, all of them 22 1/2 inches long: six pieces measuring 3/4-inch by 3/4-inch; four pieces measuring 3/4-inch by 1 1/2 inches wide; and one piece measuring 3/4-inch by 5 1/2 inches. The 5 1/2-inch brace needs a bevel down one side so that it will line up with the angle where the drying chamber and collector box meet. You can cut this bevel with a circular saw adjusted to a 116-degree angle (your angle will be

different if you're building a dehydrator customized to your latitude) and with a rip guide installed.

To install the braces, place the two large sides upside down and side by side on sawhorses so that they're balanced on their edges and spaced about 2 feet apart. Install the 3/4-inch-by-5-1/2-inch beveled brace between the sides where the collector box and drying chamber meet, and set a 3/4-inch by 3/4-inch brace at the air intake end of the collector box. Be sure to predrill the holes using a No. 8 countersink bit, and fasten the braces in place with 1 5/8-inch No. 8 exterior-grade Phillips screws. Now the two dehydrator sides should be held together by the two braces.

Step 4: Cut and Install the Collector Box Bottom

Step 4

Remember that sheet of quarter-inch exterior grade plywood in the materials list? Cut a 24-inch-wide piece from it that's the same length as the bottom of the collector box. In this design, the length is 6 feet and 11 inches, but the dimension will be different if you changed the angle of the collector to make a solar dehydrator specific to your latitude.

With the two joined sides still upside down on the sawhorses, place a healthy strip of waterproof wood glue down both edges of the side pieces and on the 5 1/2-inch and 3/4-inch braces you just installed. Then lay the quarter-inch plywood bottom over the dehydrator sides and secure it in place with 1 1/4-inch exterior screws every foot or so. Use 1-inch screws when securing the bottom to the braces so that the screws won't poke through to the other side. Seal the bottom around its entire perimeter so no air can leak in and affect the operation of the collector box.

After you're finished securing the bottom of the collector box, turn over the dehydrator and install the remaining braces as directed in the detailed drawing ("How it Works," above) remembering to predrill holes before installing screws — two screws per 1-1/2-inch-wide brace.

Step 5: Install the Drying Chamber Front and Vent Screens

Now you're ready to install the drying chamber's front — it's the painted 22-1/2-by-24-inch piece of three-quarters-inch plywood you've already prepared using the cutting diagram in Step 1. One of the front's 24-inch-long sides needs to be beveled to fit tightly against the brace at the top of the drying chamber. Glue and then screw this piece, beveled edge on the top, to the front of the drying chamber. Make sure the bottom, unbeveled edge of the front fits snugly against the angle at the top of the collector box. From the inside of the drying chamber, run a bead of silicone caulk around the perimeter of the front to prevent air leaks.

After you've installed the front panel, you'll notice that it ends about 5 inches below the top of the sides. The same situation will apply to the door on the back, which you'll install later. These gaps are important for the function of the dehydrator because they serve as vents. Eventually you'll build vent covers, but all you need to do now is to grab a staple gun and secure aluminum screening to the interior at the vents. Staple the screen to the braces at the top and bottom of the vent openings on both the front and back of the drying chamber. While you're at it, also staple aluminum screening over the intake vent at the bottom of the collector box, again from the interior. You can frame the air intake with three-quarters-inch wooden strips on the exterior if you prefer a finished look.

Step 6: Build the Drying Shelf Supports and Roof

Step 6 - Tray Supports

These solar food dehydrator plans call for 11 supports for 11 three-quarters-inch plywood shelves inside the drying chamber. You can cut the three-quarters-by-three-quarters-inch supports from a 1-by-6 pine board with a circular saw using a rip guide. Each support is 16 inches long except for the lowest support, which is 15 1/4 inches long to avoid the lowest brace

inside the drying chamber. Measure and mark both sides of the inside of the drying chamber for the shelf supports, spacing them 1 inch apart. Predrill the holes before fastening the supports to the sides of the drying chamber with 1-1/4-inch exterior-grade Phillips screws. Make sure you don't drill the screws so deep that their points project through the sides of the food dryer.

Step 6 - Roof Installation

The solar dehydrator's roof is made of two pieces of three-quarters-inch plywood, preferably scraps you have lying around in your workshop. You also can create three-quarters-inch plywood by gluing together several pieces of the one-quarter-inch plywood left over from cutting the front of the dehydrator. The roof is made up of two 12-by-30-inch pieces, with 30-degree bevels along one long edge so they can join tightly at the peak. Attach the roof pieces to the dehydrator sides and braces with 1-1/4-inch screws.

Step 7: Legs, Wheels and Handles

Step 7 Front Leg Installation

It’s time to get the solar dehydrator standing on its own four legs. These plans call for two front and two rear legs made from pressure-treated 2-by-4s, and attached to the dehydrator using two 3/8-inch-diameter-by-3-inch-long bolts, nuts and washers each. Install the two front legs first, cutting them 18 inches long with a 26-degree angle on the top end. Locate the front legs

approximately 6 inches from the bottom front edge of the collector box, predrill the holes and secure the legs to the sides of the collector box using the nuts and washers. Approximately 2 inches from the bottom of both legs, drill a half-inch hole through the center to receive a half-inch-diameter steel axle mounted with two 8-inch-diameter wheels.

Now that the front legs are attached, you can lift up the dehydrator to measure for the two rear legs. Place a small level on the top shelf support inside the drying chamber, then recruit a helper to lift the dehydrator until the unit is level while you measure the distance from the peak of the roof to the floor. In these solar food dehydrator plans, the legs are 76 1/2 inches long. When preparing the rear legs, cut 30-degree angles from the centers of both 2-by-4s on the top ends so the legs will fit snugly to the roof of the dryer. As you're bolting the rear legs to the drying chamber, take care that the bolts won't interfere with the operation of the shelves.

Step 8: Vent Covers

Front Vent Covers

This dehydrator design calls for vents at the top of the drying chamber on both the front and back, just below the roof. These vents are essential for effective operation of the food dryer: As cool air enters the intake at the bottom and become heated in the collection chamber, it must rise into the drying chamber where it will absorb moisture from the food before exiting through

the upper vents.

You've already stapled aluminum screen to the inside of the vent openings. Now you need to make vent covers to help control air flow when you're drying food. You'll remember marking and cutting four 5-1/2-inch-wide-by-12-inch-long vent covers when you followed the cutting diagram for the sheet of three-quarters-inch plywood in Step 1. Grab a pair of these covers and prepare them for installation on the front of the dehydrator by cutting a 30-degree bevel along one of the long edges of each one. The front vent covers should be installed with the beveled edge on the top, where it will help the covers fit tightly against the slant of the roof. To hold the covers in place along the bottom edge, you'll need to screw a 2-by-24-inch strip of wood to the interior brace at this location on the front of the drying chamber. Some adjustments may be required for the vent covers to fit well. To provide a little more sliding room, you can try adding a piece of bicycle inner tube between the wood strip and the front panel.

Step 8 Rear Vents

To install the back vent covers, you'll first need to build up the 1-1/2-inch-wide brace at this location so it can support both the covers and the door (which you'll install next). Attach a 3/4-by-3/4-by-24-inch strip of wood to the top half of the brace, and then screw a 1-1/2-by-3/4-by-24-inch wooden piece to the top of the strip you just placed on the brace. Drill pilot holes to avoid cracking the wood, and be sure to stagger the screws for the first and second strips.

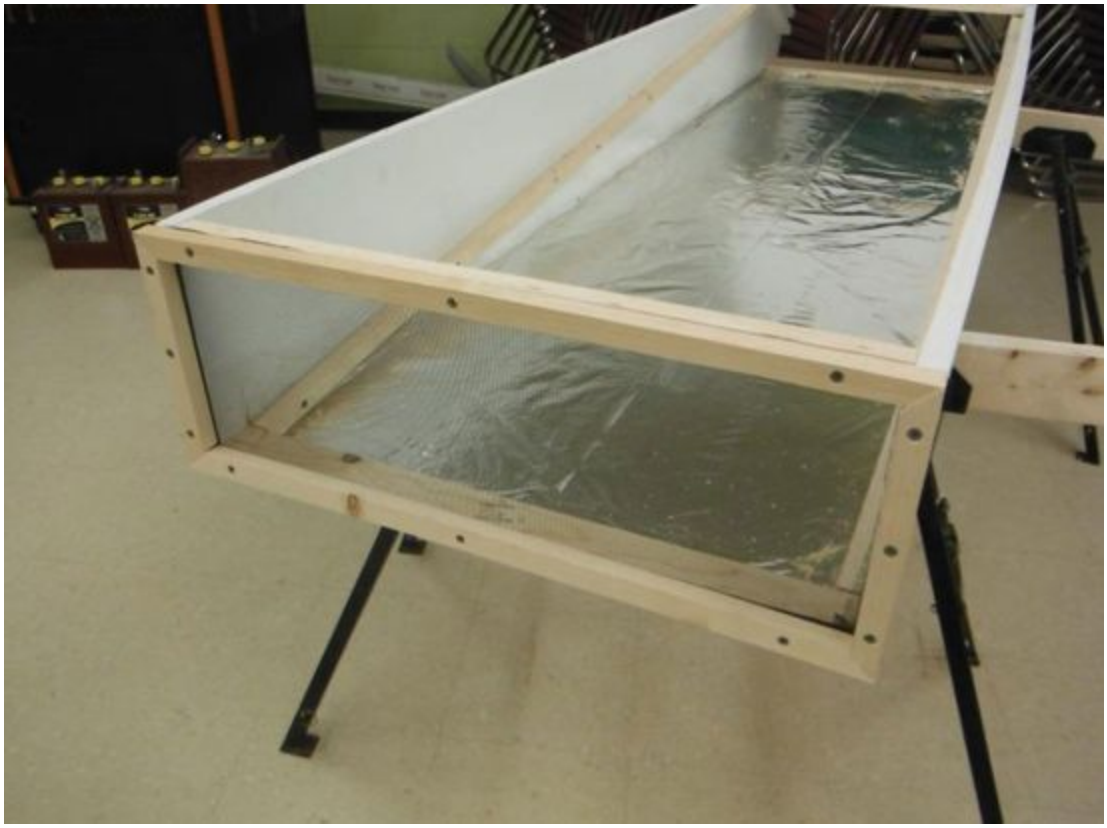
Step 9: Drying Chamber Door

Step 9 - Front Door

Obviously, you'll need a door to access the shelves inside the drying chamber. The door is a 24-1/2-inch-high-by-25-1/2-inch-wide piece of painted plywood that you marked and cut using the cutting diagram in Step 1. It should open by swinging down from the top, so fasten it to the back of the drying chamber with two heavy-duty metal hinges that you've secured at the bottom using nuts and bolts. Instead of allowing the open door to slam against the dehydrator, you can rig it to stop parallel to the ground so that it can be used as a shelf when you're loading or unloading the dehydrator. Make a shelf stop by securing two strands of quarter-inch braided nylon cord to the drying chamber on one end and the top corners of the door on the other end.

The door is 1 1/2 inches wider than the dehydrator, making it extend past the unit three-quarters-inch on both sides. This allows you to install four hook and eye fasteners — two on each side — to get a tight fit when you close the door. Finally, apply weatherstripping around the perimeter of the door frame to create an effective seal.

Step 10: Build the Absorber



Step 10 Absorber

In this step, you'll be installing materials inside the collector box to absorb and transmit the sun's heat to the surrounding air. The "absorber" can be made of either charcoal-colored aluminum window screen or the type of metal lath used in plaster work. Although screen is easy to work with and relatively inexpensive, our tests found that lath produces higher temperatures. Because this design is for the best food dehydrator you can build, we recommend lath for the absorber material.

Hardware stores sell lath in 8-feet-by-27-inch sheets. To make the absorber, you'll need six 22-1/2-by-69-inch sheets that you've trimmed to size with tinsnips — be sure to wear heavy work gloves to protect your hands from the sharp edges of the screen. Spray-paint the lath strips black using high-temperature flat paint. While the lath is drying, prepare the interior of the collector box by covering the bottom with heavy-duty aluminum foil and gluing it in place.

Absorber

The layers of lath will be positioned diagonally inside the collector box, extending from the bottom of the air intake up to the top of the collector box, just below the drying chamber. The layers of heavy metal lath need to be supported, so secure a three-quarters-inch wooden strip

diagonally on the interior sides of the collector box using 1-1/4-inch wood screws, setting them at the same diagonal at which you'll be placing the layers of lath. Set one strip of lath at a time on top of these strips, holding the layers in place by screwing a few screws into the wooden supports at the sides and bottom. At the top, you can bend the lath up over the brace and fasten it into place with screws.

Step 11: Glazing

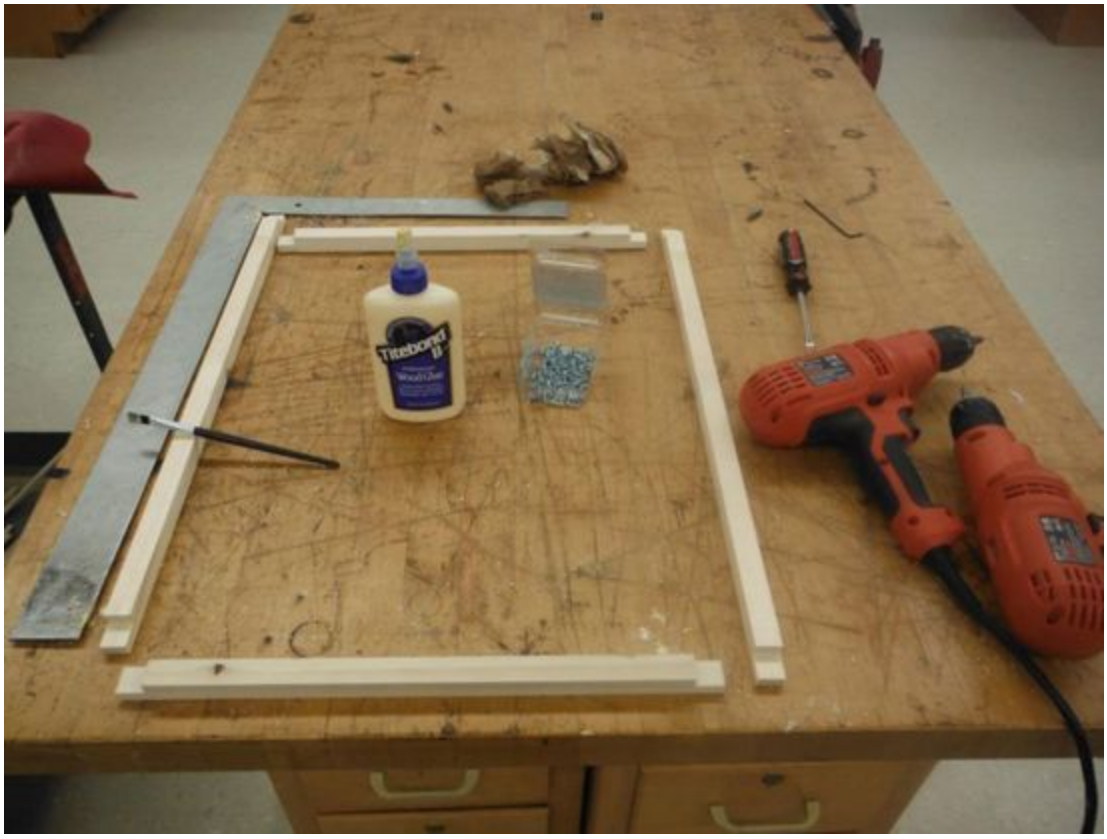
Step 11 Glazing

You'll need to cover the top of the collector box with glazing so the sun's energy can penetrate and be soaked up by the absorber. Any plastic glazing will work, but the best option for this dehydrator design is a strong, fiberglass-reinforced polyester (FRP) material. FRP is thick, durable and translucent and used in many solar technologies. Expect to pay about $2.50 per square foot for .040-inch-thick Sun-Lite HP glazing from Solar Components Corporation. You can purchase this glazing in a variety of widths and lengths, then trim it to fit the front of your dehydrator's collector box (24-inch-wide-by-70-inch-long in this design; your dimensions may vary) using tinsnips or a utility knife.

Before installing the glazing, prepare the strips that will hold it in place on the top of the collector box by measuring and cutting three-quarters-inch-wide by one-eighths-inch-thick aluminum bar stock to fit the top of the box. Predrill holes on all of the aluminum strips. Lay the sheet of FRP — smoothest side up — on top of the collector box. Set the top aluminum bar in place and drill through its predrilled holes, through the FRP and into the dehydrator sides.

Remove the glazing from the dehydrator and run a bead of silicone caulk across the top edge of the collector box before carefully setting the glazing back into place. Secure only the top aluminum bar to the FRP and collector box with 1-inch No. 8 stainless-steel, round-head screws. Make sure the glazing is straight on the collector box throughout this process. Gently lift up the glazing and run a bead of caulk down the edge of the collector box on one side before predrilling and screwing the edge into place. Repeat these steps with the other side and the bottom.

Step 12: Make the Drying Trays



Step 12 - Drying Tray

The drying chamber will hold 11 rectangular trays for dehydrating food. You'll want to build trays with wooden frames that will stand up to lots of use, but with screened bottoms so air can circulate around the drying food. Use four 1-by-6s to make the frame components. Cut two of these boards into 22-1/4-inch lengths, and the other two into pieces measuring 16 inches long.

Use a router with a three-quarters-inch straight bit and a cutting guide to carve a three-eighths-inch-deep rabbet on one side of both ends of every piece. Then rip all of the boards into three-quarters-inch-wide strips using a table saw or a circular saw with a rip fence attached. You should now have 22 pieces measuring 22 1/4 inches long, and 22 more pieces at 16 inches long, all of them three-quarters-inch thick and with rabbeted ends. Your next step is to assemble the frames so they're perfectly square. Use a framing square to set up a jig, and lay

out and square up two 22-1/4-inch-long pieces and two 16-inch-long pieces into a frame. Glue the pieces at each corner and secure the rabbet joints with one 1 5/8-inch-long flat-head Phillips screw each. Repeat these steps until you've built the frames for all 11 trays. After the glue dries, cut food-grade screen to size and staple the screen to one side of each frame using a staple gun. The screen can be purchased from MacManiman Inc.

Step 13: Ready to Dry!

You're nearly finished building the solar dehydrator! Just nail some shingles to the roof to shed the rain, bolt some 24-inch scrap 2-by-4 handles to the rear legs to make the unit easier to move around, and you're ready to dry some food.

Get an early start on a warm, sunny day. Slice about 5 pounds of food — apples are great for beginners — into uniformly thin pieces about one-eighth-inch thick. Spread out the pieces on the drying trays. Open one set of the vent covers (on the leeward side if it's a windy day) to approximately 3 inches. Don't forget to check the food at the end of the day for dryness. Food is dry when the moisture content lower such that the food weighs between 10 and 20 percent of its original weight.

How to Use a Solar Food Dehydrator

Browse these resources for additional information on how to use food dehydrators, including instructions on drying different types of edible goodies.

Preserving Food Using Homemade Food Dehydrators
Making Sun-Dried Tomatoes in a Solar Food Dehydrator
Drying Herbs in Solar Food Dehydrators
How to Preserve Food Using Sun Drying and Natural Methods

Dennis Scanlin is a Professor of Technology and Environmental Design at Appalachian State University in Boone, N.C. For the past 30 years, he has coordinated the university's Appropriate Technology Program where he and his students have built and tested many renewable energy systems.

Materials needed *(dimentsions still need to be adjusted to this design)*

- One " 214cm x 68.5cm (4' x 8' ¾) CDX exterior plywood (sides, vent covers and door)
- One 4' x 8' 1/4" exterior plywood (bottom, roof and south wall of drying box)
- Wooden struts (supporting outer lining at most critical places)
-
- Approx. 12 - 8' long 1x2 pine (strut)
- Two 8' long PT 2x4 (dryer legs)
- Glazing (e.g. bla bla, here)
-
- Water resistant glue
- Caulk or glazing tape
- Eight 1/4" X 2 1/4" lag bolts and washers
- 24" wide by 30' long piece of black or dark gray aluminum window screen (.65/FT)
- Ten 21" x 14.5" Stainless steel screen for drying shelves ($6.62/SF) adds another $150 to cost or could use a vinyl or vinyl clad fiberglass screen for about .35/SF
- 24" X 12 ft. 0.040 Sun Lite HP plastic glazing ($1.85/SF)
- Two 3 1/4" strap hinges approx.
- Fifty 1 1/2" galvanized deck screws
- Paint
- Two 2" hook and eyes

- One 4' x 8' 3/4" celotex foil faced polyisocyanurate insulation board

Insulating foam (e.g. Celotex Tuff-R polyisocyanurate foam insulation)
Joints

Tools needed

- Tape measure
- Pen
- Razor knife
- Skill saw
- Jig saw (optional)
- Screw driver
-

Additional Construction comments:
"The dehydrator should face south for best stationary performance"
And the altitude angle of the glazing above horizontal
"The altitude
angle of the glazing above horizontal should be the compliment of the average noon altitude angle of the sun at your latitude for the months you expect to be using the dryer or your latitude minus 10°, if you primarily intend to use it during the later part of the summer and early part of fall. For our latitude here in Boone, NC of 36° that would be 26°. The dryer pictured has an angle of 36°.
The sides and bottom of the collector and the sides, door and top of the drying chamber are insulated with 1/2" Celotex Tuff-R polyisocyanurate foam insulation. It normally is covered with an aluminum foil. I am going to use 3/4" in the next one constructed. Making sure you

tightly construct the collector by making good tight fitting joints, especially the door, and using caulks and/or gasket material is also desirable. And finally adding a reflector to the dryer and properly positioning it (about 20° above horizontal in early October to 40° in mid July at 36° N LAT) will improve the performance.

How to build

Start with plotting the parts out of plywood (Illustration 1&2) and cut these out with a skill or jig saw. Do the same for the bottom parts (illustration), use a skill saw. “Use the plywood side pieces to layout the insulation board dryer side pieces and cut with a razor knife. Glue the insulation to the plywood sides and then connect the sides together by gluing and screwing or nailing the plywood bottom on and screwing the 22 1/2" long wooden struts made from 1x2 stock in place.

Materials needed *(dimentsions still need to be adjusted to this design)*

- One 4' x 8' 3/4" CDX exterior plywood (sides, vent covers and door)
- One 4' x 8' 1/4" exterior plywood (bottom, roof and south wall of drying box)
- Approx. 12 - 8' long 1x2 pine
- Two 8' long PT 2x4 (dryer legs)
- Water resistant glue
- Caulk or glazing tape
- Eight 1/4" X 2 1/4" lag bolts and washers
- 24" wide by 30' long piece of black or dark gray aluminum window screen (.65/FT)
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- Fifty 1 1/2" galvanized deck screws
- Paint
- Two 2" hook and eyes
- One 4' x 8' 3/4" celotex foil faced polyisocyanurate insulation board

Tools needed

Final Drawings *(not sure if to place here or after material list)*

How to build

How to use
“There are three major factors affecting food drying: temperature, humidity and air flow. They are interactive. Increasing the vent area by opening vent covers will decrease the temperature and increase the air flow, without having a great effect on the relative humidity of the entering air. In general more air flow is desired in the early stages of drying to remove free water or water around the cells and on the surface. Reducing the vent area by partially closing the vent covers will increase the temperature and decrease the relative humidity of the entering air and the air flow. This would be the preferred set up during the later stages of drying when the bound water needs to be driven out of the cells and to the surface.”

List of at which terperature to operate…..

Potential Improvements

The solar collector heats air and since warm air rises, in this case it rises into the cabinet (which is placed above the solar dehydrator). This flow of warm air passes across the trays of food, absorbs moisture and escapes out the top.

This is our finished solar dryer, 12 by 4 feet, with 2x2 foot stainless steel screens framed in 2x2 inch cedar, and one of the 4 by 4 foot heat-generating solar collector panels raised for access. Sunlight shines through the clear glazing, lowering the frequency of the light to make more infrared (heating via the greenhouse effect). Moving inward, it then hits a black-painted aluminum sheet, heating the metal. The back side of the black aluminum re-radiates heat onto the food below, causing the food to heat up and lose moisture while keeping sunlight off the food itself. Moisture given off by the heated food passively flows out under the screens and up the sloped air channels under the screens. And the galvanized steel roofing, with raised ribs forming the air channels, reflects heat back up toward the food, improving overall efficiency. It's not the prettiest dryer, not the most compact, and not the cheapest. *It simply does what it is intended to do very well by following the rule I always tell people, "You can't fight physics!"*

http://www.shiftfrequency.com/build-solar-food-dehydrator/http://www.shiftfrequency.com/build-solar-food-dehydrator/