The following photos are all from a solar dryer construction workshop held in May, 2011. The participants built a total of ten 4-by-4-foot dryers and five 2-by-4-foot dryers in about 7 hours, including time for lunch. We built a total of fifty-two 2-by-2-foot screens for these dryers so a crew of 3 people was set up just for cutting the stainless screen. Note that faces in the photos have been smudged.

Here we see the type 304, 12-by-12 mesh, .018-inch thick, woven stainless steel screen being cut into 23-inch by 23-inch pieces from a 4-foot wide, 100-foot long roll purchased from a distributor of “wire cloth”. We did 23-inch pieces instead of a full 2-foot size since the screen frames were being cut with a recessed stapling groove that keeps the sharp screen edges back from the edge of the screen frames. This helps to avoid future cuts in handling them. The first cut removes a 4-foot wide, 23-inch piece from the roll. Then two 23-inch squares are cut from that longer section. The best metal shears was the one at the left, a model with serrated, chrome-molybdenum steel blades made by Stanley Tools.
Here we see the saw cuts being made to recess the screen edges into the red cedar, 2-by-2-inch boards that make the screen frames. The boards with the 45-degree miter cuts at the right are run through a table saw with a spacer board clamped to the table. This allowed a half-inch deep cut to be made right at the bottom inside edge of the screen frame boards. The finished boards are at the left, and if you zoom in closely you will see the grooves cut to hold the stainless screens.

Below you can see the 8-foot long, red cedar, 2-by-2 boards getting cut into 2-foot chunks with 45-degree miter cuts using a chop saw. Lots of noise with both saws running, but the accuracy of the cuts is worth the din when you are using new wood that cost a bit of money and used precious forest resources to make a durable product.
Here we see those 2-by-2-inch boards with the miter cuts and screen slots being drilled at a preset angle using a drill press with a clamped down wooded jig. The angle was drilled so that the screws holding the screen frames together did not have to be very close to the board ends. This helps to prevent splitting the wood when the screws are tightened. With perfect joints and pre-drilled holes, only one screw at each corner was needed and no glue was used. Clamps held everything flat and square for drilling.
And here we see the screens getting stapled down into their grooves in the assembled frames. The staples are stainless steel, but in other models we have used short stainless steel screws. Both work well, but while the screws hold the screen more tightly, the staples are quicker to apply.

Finally, to keep food out of the spaces at the edges where screen meets frame, a bead of 100% silicone caulk is applied and pushed into the crack between the screen and frame. A discarded box is used to keep food off the work surfaces. Then the screens are flipped and the caulk is flattened down and the excess wiped up with a rag. The caulk is using gloves. This stuff is messy to work with and smells like vinegar since its solvent, glacial acetic acid, is vinegar's purified kin.

At this point the screens are left to dry and we move on to building the solar collectors.
The solar collectors rely on black aluminum sheets to soak up solar energy and re-radiate it down onto the food. In hot climates, low latitudes, and high altitudes you might use blue, green, brown, or red metal to absorb less heat. But here in the humid Upper Midwest of the U.S. we need all of the collection efficiency we can get. This aluminum was ordered with one side already painted flat black at the factory. The other side was sand-colored so we had to paint it. Ideally that is done with high-temperature paint made for outdoor grills (sometimes called “BBQ black paint”). Right, the metal is being marked square and cut into 47-inch lengths, again so that it can be fit into the recessed grooves of a 2-by-4 or 4-by-4-foot red cedar frame. Below, a 4-by-4 frame is being assembled with two metal sheets and short aluminum roofing nails at 6-inch intervals.
Once the metal is fastened to a cedar frame it can be painted on its other side. This was brush-on latex paint rated for 200F instead of high temperature BBQ black paint. It was used to avoid toxic fumes in the workspace while the other jobs were taking place. Still, when it is dry it too must be exposed to sunlight for a few days to “bake off” any remaining solvents. Note the extra cedar 2-by-2 used to support the sheets where they overlap.

While the collector frames were assembled, another crew cut the polycarbonate glazing sheets to 48-inch lengths. The sheets were purchased in nominal 24-inch widths. So while one sheet was sufficient for a 2-by-4-foot dryer (with an edge trimmed where it exceeds 24 inches to normally overlap with another sheet), 2 sheets were mounted side-by-side on the collector frames using short galvanized screws with rubber washers.
Here we see those screws going into place using a cordless drill. The open spaces between the corrugations in the polycarbonate sheets and the collector frames can either be filled with foam filler strips made by the glazing manufacturer or they can be left open without sacrificing much efficiency (except perhaps in very windy areas).

And while collectors were assembled the cut-off saw was used to miter 45-degree corners into treated wood, 8-foot 2-by-4s. Actually, the person shown is about to cut it incorrectly because the board is resting on its “face” instead of its edge!

Cut into either 4 foot or 2 foot lengths, these were used to assemble the dryer bases. The bases hold galvanized, corrugated metal roofing, screwed onto their tops with short, galvanized screws with rubber washers. The bases were built using 3 screws at each corner and again were pre-drilled using the drill press and jig. The bases can be mounted on treated wood legs buried partway into the ground for stability. Or you can mount them to steel fence “T-posts” using “U-bolts” drilled through the 2-by-4’s sides. Or you could just prop them up on some concrete blocks and hope that the wind doesn't blow them away.
This shows a crew of bases assemblers putting screws through some recycled galvanized steel roofing. The corrugations act as air channels. They allow warm, moist air escaping from the food on the screens to flow away from the food. If the bases are mounted with the corrugations running north-south, and with a slight slope north-to-south (we usually shoot for 10 to 15 degrees, or about an 8 inch difference in height above the ground) the warm, moist air will flow out the upper end and fresh, dry air will flow into the lower end.

Below we see the north side of a dryer (in the northern hemisphere) with hinges in place between the collector and base, allowing the dryer to be opened so the screens can be removed or loaded with food easily.
This shows the finished dryer from its south side (in the northern hemisphere), with the hasp in place between the collector and base that locks it together. You can also see some small cedar blocks in place that keep the screens from falling out when the dryer is at its normal 15-degree tilt. Put it out in the sun on some legs to place it at a convenient working height and you are ready for a sunny day of food drying. If the legs are adjustable to vary the tilt, you can optimize the dryer's incident angle to the sun, improving its efficiency. For autumn apples, when the sun is low to the horizon, (or if you live in more polar latitudes) you can either raise the tilt or use a reflective (white or silver) wall behind the dryer to reflect additional sun onto the collector. If the tilt is too great you may find that those peas you are trying to dry all end up at the bottom of the screens!

Here are 10 of the 4-by-4-foot dryers built during this workshop. The 2-by-4-footers are behind the crew. With a good group, good organization, someone in charge of obtaining all of the materials and tools, and a good workspace, you can achieve a lot in a day!