Construction manual cardboard solar food dryer

Note

These instructions show how a cardboard solar dryer *is built*. The information how to *use* it can be found in the document ‹Solar Food Drying› in the SgS Challenge Manual or on the SDG Hub.

Solar drying is probably the oldest food conservation method ever. Many centuries ago, our ancestors found out that they can keep a fish or a fruit for a longer period of time if they let it dry in the sun. It is still a useful and widely used method today. Let's try to make our own healthy snacks for the next hike or camping trip by drying fruit in a simple solar food dryer!

Safety note

Be cautious when handling sharp objects and tools.

Material

You will need the following materials for the construction:

- Cardboard from big boxes
- A thin metal sheet, preferably aluminium
- Metal wire, semi-rigid
- 4 wooden strips
- Transparent plastic (polyethylene)
- A piece of cotton mesh
- Two small bits of cloth or leather
- Paper glue
- Some sheets of paper
- Fine wire
- Fine bamboo or wooden sticks (as they are used for Satay, for instance)
- Water based black paint
- Reflective aluminium foil
- A string
- Tape
- Acrylic paint for the outside
- Optional: Thumbtacks
- Optional: Staples

Tools

For the construction, you will need the following tools:

- Scissors and/or utility knife ('cutter')
- Paint brushes
- A big nail used to 'drill' cardboard
- A ruler
- Plyers
- Optional: staple gun

Step by step instruction

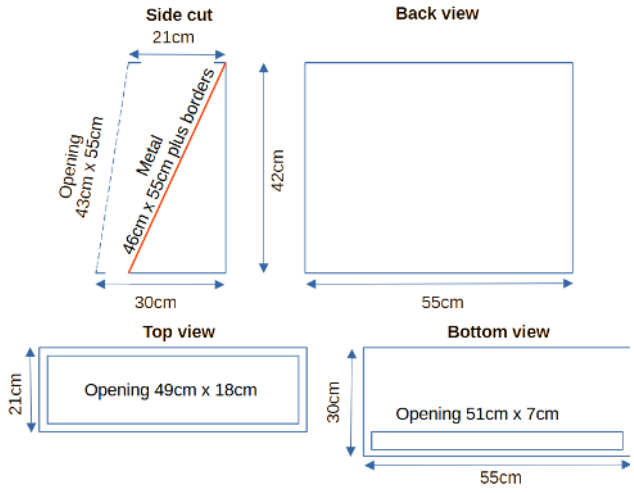
Remark: This text describes a simplified cardboard version of the 'Kiin' solar dryer designed by Bernhard S. Müller and presented in the 'useful links' section.

View of the finished solar dryer.

Side view of the finished solar dryer.

Step 1: Prepare the box

Cut the cardboard box and glue it with small sheets of paper and white glue or using tape to get a box as shown on the pictures (see tested dimensions below). Cut a large rectangular opening in the top side and a smaller one in the bottom side. Attach 4 wooden legs to the box (use glue, staples, etc.).



These are tested dimensions of a box. You can adapt them to the cardboard which you have at hand.

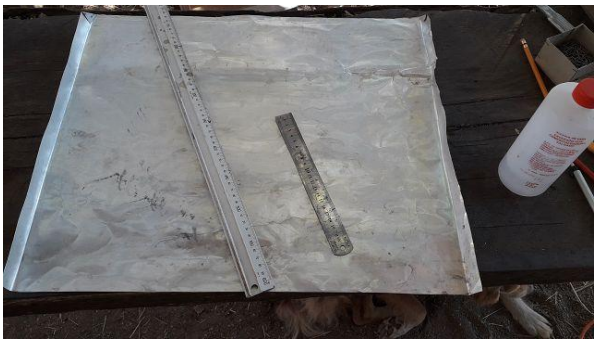
Give the box its shape. Repair and reinforce weak parts by glueing bits of paper using diluted white glue.

Reinforce weak parts with glued bits of paper.

Attach 4 legs to the box.

Step 2: Place the aluminium sheet inside the box

The front side is completely open. Cut the aluminium sheet to size so that you can fit it diagonally into the box. Attach the sheet on both sides with fine wire. Paint the inside (everything visible from the front opening) black.



Cut the thin metal sheet to size.

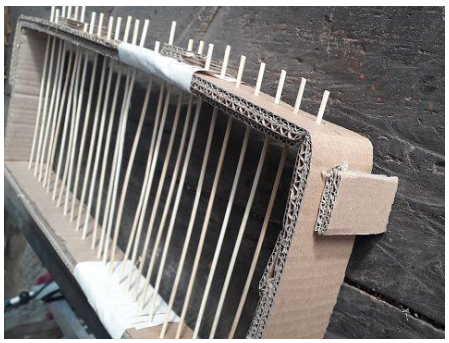
Attach the metal sheet diagonally inside the box.

Paint the inside black.

Step 3: Prepare the drying frame

Cut cardboard into strips and glue two layers of cardboard in the shape of a rectangular frame. The frame should be standing on the border of the upper opening of the dryer. Add a few pieces of cardboard to the sides which prevent the frame from sliding to one side or the other. Make holes on both long sides of the frame (using a nail, for instance) and insert the bamboo or wooden sticks to make a ‘grill’.

Cut cardboard into 6cm wide strips and glue them in a way to make a rectangular frame.



Insert bamboo sticks to make a ‘grill’.

Step 4: Add the reflector

Cut another cardboard to the size of the front opening of the dryer (43cm x 55cm in our example). Glue the aluminium foil to one side using white glue and a very soft cloth to wipe the surface carefully. Use two bits of cloth as ‘hinge’ and glue them between the lower part of the box and the reflector. Make a hole in one upper corner of the reflector and another one into the cardboard box and insert a string which can fix the opening angle of the reflector. Now, you might paint the outside of the dryer and the frame(s) in the colour of your choice.

Cut the cardboard to size and glue aluminium foil onto it.

Attach the reflector with ‘hinges’ you make of bits of cloth.

Step 5: Close the window

Cut the plastic film to the size of the front opening of the box plus 2cm on each side. Attach the film to the sides of the ‘window’ using staples, tape, double sided tape, etc.

The plastic film is cut to size and attached to the front opening to create a window.

Set-up in use

The slices of fruit are laid out on the bamboo sticks and covered by a bit of mosquito net.

The driers reflector is opened and the drier oriented towards the sun.

Practical information

Time needed

3 to 4 hours for making a dryer, 1/2 hour for preparing the fruit, 1 to 3 sunny days to dry the fruit

Age range

Constructing the dryer: 11 and above, using the dryer: 7 and above

Useful links

Inspiration for the cardboard model:
https://static.wikia.nocookie.net/solarcooking/images/8/8e/Kiin_EN_Wiki.pdf/revision/latest

The information **how to use** it can be found in the document ‹Solar Food Drying› here (https://solafrica.ch/wp-content/uploads/2026/01/Instructions-Solar-food-drying.pdf) or on the SDG Hub (https://sdgs.scout.org/) .