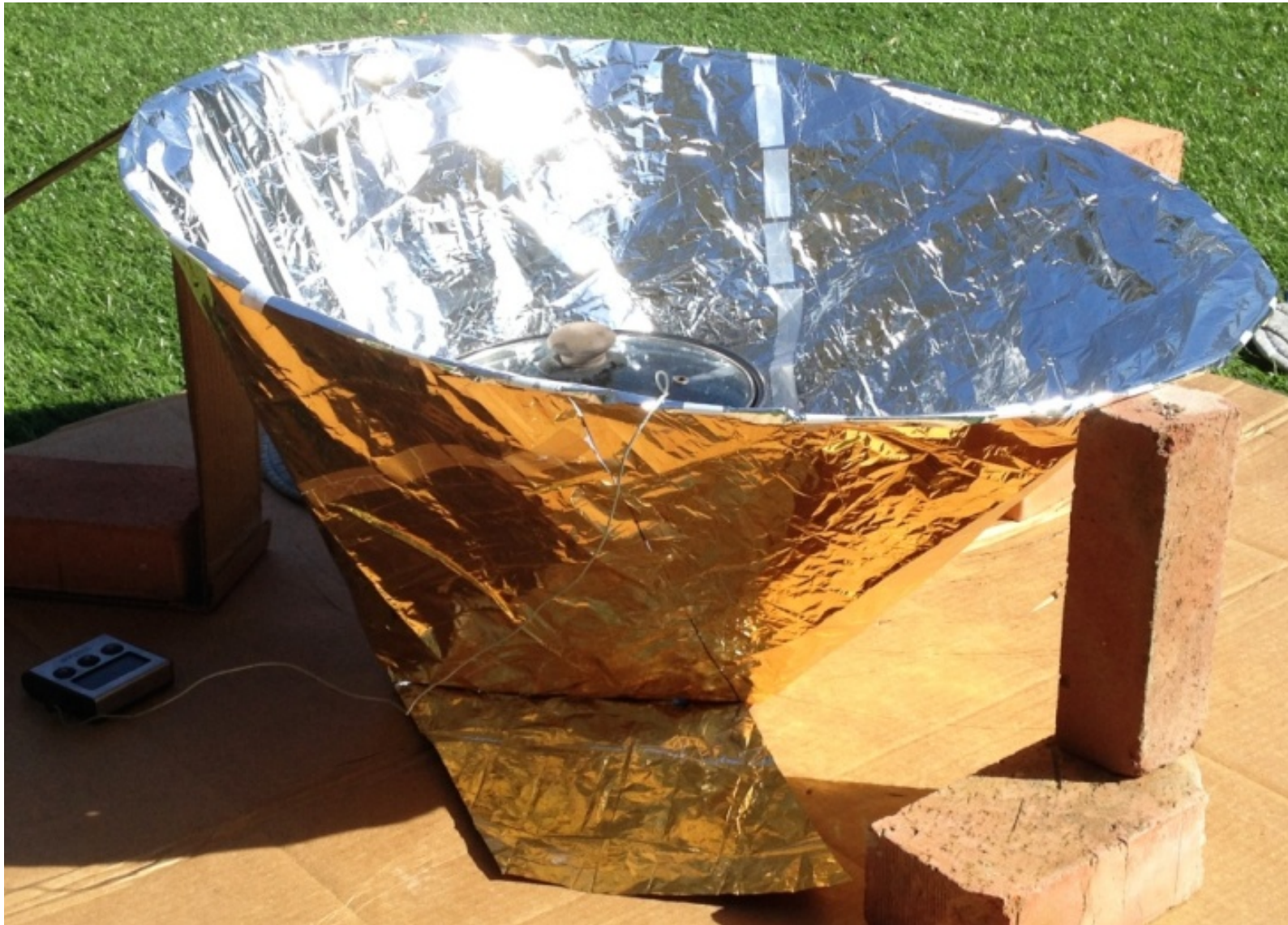


Haines Solar Cookers and Cooking Sleeve

Roger Haines of San Diego, {{state|California}}, [[USA]] has designed a cooking sleeve as an alternative to plastic cooking bags, and three solar cookers.

A. Haines Cooking Sleeve

The ""Haines Cooking Sleeve"" eliminates the nylon cooking bag commonly used in solar cooking. This sleeve is a 6" x 36" rectangle of polyester film or UV-stabilized polycarbonate film (.020"), which is rolled into a cylinder to enclose the bottom and sides



of the pot but not the top. The cylinder is held together with jumbo paper clips, which allows its diameter to be adjusted to fit a variety of cooking pots. The pots must be round, with no handles, and must have a top rim that can rest on the top of the cylinder. The cylinder elevates the pot above the surface of the cooker, allowing the sun's rays to

bounce off the reflective surface of the cooker and be absorbed by the bottom as well as the sides of the cooking pot. It also provides an insulating "greenhouse" making a traditional cooking bag unnecessary. Additional heat can be retained by attaching a circle of plastic film on top of the lid.

{{clr}}

B. Haines "Pop-open" Solar Cooker

The "Haines Pop-open Solar Cooker" works like a "pop-open car sunshade. The cooker's unique template, thin material, and "pop-open" design permits it to be shipped and stored in a small envelope despite its 30" round diameter by 18" high size when it is "popped open." The design allows it to be stretched rigid in windy conditions, and a transparent windscreen creates "oven-like" conditions around the cooking pot.

The cooker is made from reflective plastic film (e.g. Mylar or metalized polyester) or reflective fabric). The material must be "slippery" to the touch. The material is sewn or glued to a 30" circle made of the same galvanized steel flat spring wire used to make pop-open car sunshades, e.g., .035-inch x .125-inch.

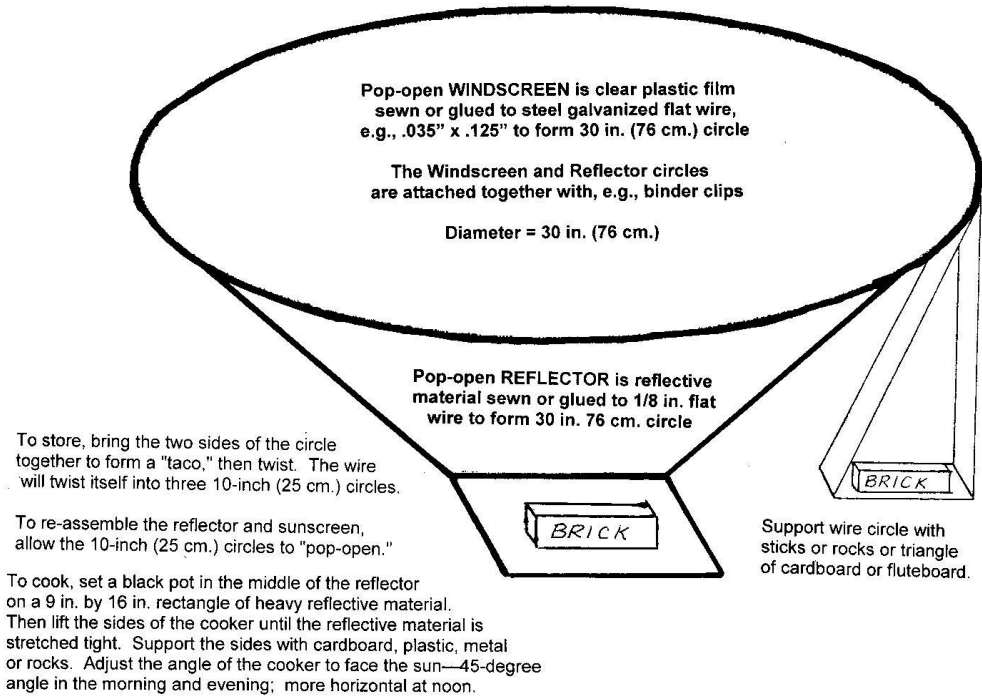
To set up the cooker, place it on a square of cardboard (to make it easy to turn to follow the sun during the day. Put a 9-inch by 16-inch rectangle of rigid reflective material (Mylar taped to cardboard will do) on the flat bottom in the center of the cooker and put a black cooking pot on the rectangle (preferably in a Haines cooking sleeve). Grab the edges of the cooker (i.e., the edges of the wire circle) and raise the edges until the reflective film is stretched tight.



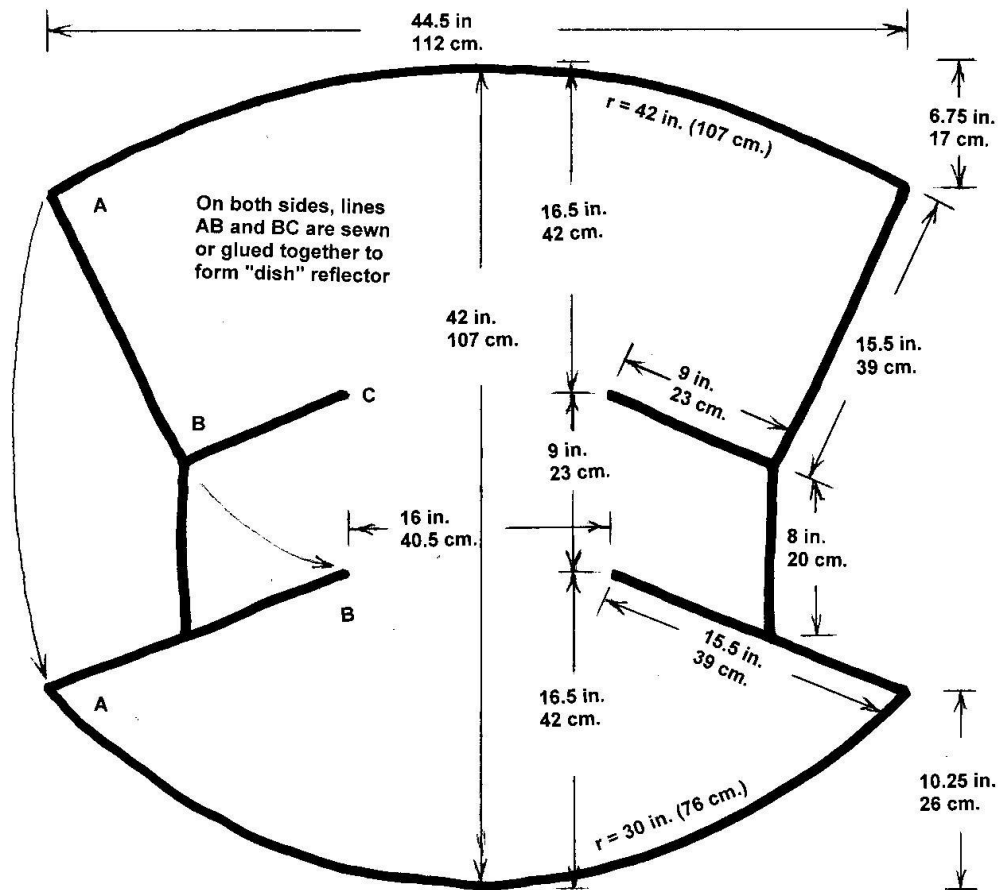
In the morning or evening when the sun is low, move the pot closer to the front of the cooker, and tilt the cooker forward, lifting the back until the front touches the ground. To make it easier to lift the back of the "bottom" of the cooker, replace the 9" x 16" thin reflective rectangle with a 3-sided 9" x 16" wire rectangle to hold the bottom of the cooker rigid as it is tilted up, while allowing the cooking pot to remain flat on the ground.

The sides of the reflector (the wire circle) can be supported by any material at hand (e.g., sticks, rocks, or triangles of plastic or cardboard). The flaps on the bottom of the cooker can be held down with bricks.

Haines Pop-Open Solar Cooker Assembled



The windscreen is made of transparent UV-resistant plastic film sewn or glued to a 30" wire circle (the same as reflector wire). The windscreen is secured to the reflector with binder clips or clothespins to create "oven-like" conditions during cooking.



Haines Pop-Open Solar Cooker Reflector Template

To store the cooker or sunscreen, bring the two sides of the 30-inch circle together and gently twist. If done properly, the wire will "automatically" twist itself into a 10-inch circle (do not force, or you will bend the wire). To re-open, simply allow the material to "pop-open."

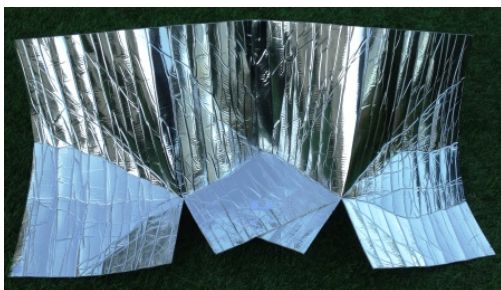
Alternatively, the cooker template can be used to make a cooker out of more rigid materials, such as reflective bubble insulation or reflective foam insulation.

C. Haines Foam Insulation Cooker and Windscreen

The Haines Foam Insulation Cooker and windscreen uses half the reflective material of the original Haines double-curve" cooker but he finds that it yields similar cooking results. The reflector is made of cross-linked polyester foam insulation with a reflective metalized polyester film coating (VMPET film -- 2mm IXPE foam -- white PET film). In the U.S., this material is used to make high-end auto sunshades. It can be purchased in China in bulk for about \$3 USD per square meter. Alternatively, the cooker can be made from reflective bubble insulation, or any other flexible reflective material.

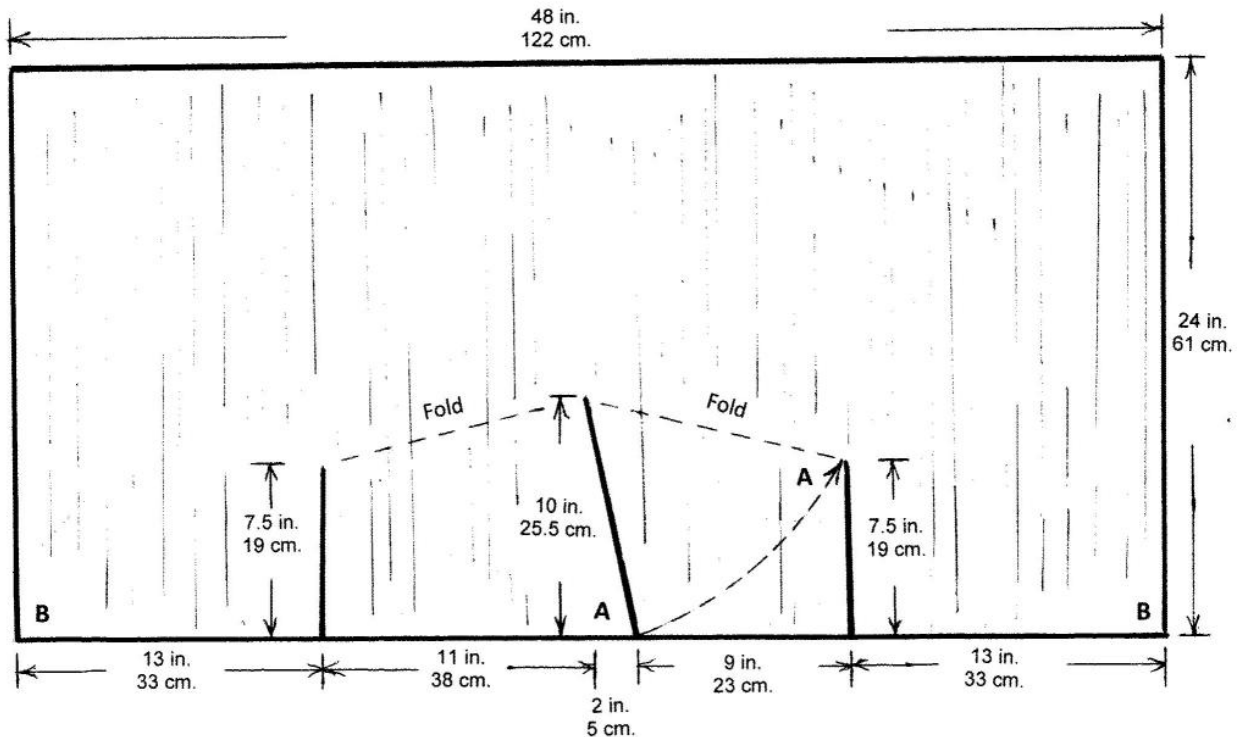


The windscreen (barely visible in the photo) is made from a 2-foot (30 cm.) diameter circle of .020-inch (0.5 mm) polyester or UV-resistant polycarbonate film. For increased rigidity, a radius cut is overlapped two inches to form a flat cone in the shape of an oriental hat. The windscreen is attached to the reflector with R-clips.



The reflector is made from a 2-foot by 4-foot (61 cm. x 122 cm.) rectangle of reflective material, with three cuts as shown in the template. Overlap the cuts as shown and secure with velcro or paper clips or other connectors.

Haines II Solar Cooker



Cut on 3 solid lines, Overlap points "A" as shown
Bring points "B" together and overlap 1 inch.

[[File:Haines_Cooker_(Side).jpg|right|300px]]

[[File:Haines_Polycarbonate_Sleeve.jpg|thumb|300px|The "'Haines Polycarbonate Sleeve"' eliminates the nylon cooking bag commonly used in solar cooking.]]

[[File:Haines_Cooker_Template.jpg|thumb|450px]]

[[File:Drawing_of_Haines_Cooker.jpg|thumb|450px|Assembly diagram for the Haines Cooker]]

D. Haines Original "Double Curve" Cooker

The [[Haines Double Curve Solar Cooker]] combines the power of a [[Funnel cooker]] with stability of the traditional [[CookIt]]. The cooker is made in the USA from a mylar-coated reflective bubble insulation material that is sold "off-the shelf" at Lowe's Home Centers in 4-foot by 25-foot rolls. The material can also be ordered on-line in the US under different brand names, and is also available in Europe, India and China. The material is strong (Roger has driven his car over it without breaking the bubbles) and it is unaffected by boiling water. The cooker is made from a single 48" by 48" rectangle of bubble material, and requires only three cuts with ordinary scissors for cooker assembly. In testing in San Diego, this cooker heated an empty pot to a sustained 380 degrees Fahrenheit (193

degrees Celsius) and heated a liter of water from room temperature to boiling in less than an hour.

The two curves of the cooker form an oval funnel that focuses the sun's rays on the cooking pot. The base of the cooker should be anchored with rocks or bricks as shown in the photo. On windy days, the bottom curve of the cooker can be prevented from being blown upward, by wrapping a circle of string around each side of the curve, and securing the string with the same brick or rock that is used to hold down the cooker. > Cutting off the corners of the bottom curve will also reduce wind problems without affecting the cooker's performance, When the sun is high, the cut at the front bottom of the cooker can be overlapped and clipped together with a binder clip to form a kind of parabola to concentrate more sun on the cooking pot.