SunStove

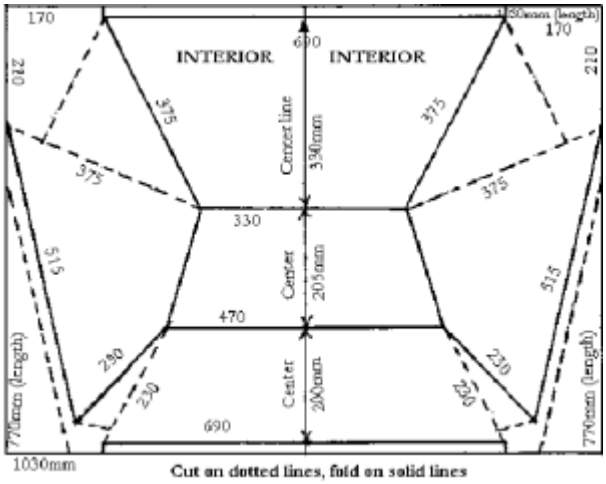
From Sun Gravity
www.sungravity.com/fabricated.html

Description

A small solar cooker, designed for a production in large quantities. The authors tried to find materials that could be easily available in every country. It's a light solar oven, easy to move and store, with a cooking capacity of 5 to 6 litres of food, enough to feed a whole family. The design has a great open area that compensates the lack of external reflectors, which would be a problem in strong wind conditions.

Materials

The case is made using moulding plastic obtained with 75% of recycled plastic and 25% of virgin material. It has also been constructed with steel, aluminium, wood, or cardboard. The interior walls are made with aluminium, actually used printing photolithograph sheets. Whereas the bottom is painted black to increase absorption of the radiation, the rest is left without treatment to reflect it against the cooking pot. The insulation is achieved with glassfiber and high density glassfiber in the bottom. Other possibilities include materials such as cotton, wood, rockwool, jute, hemp, etc, always considering that the lower aluminum side, where the pot will be placed, needs to be resistant and maintain the insulation thickness, despite the pots weight. The transparent window is a resistant acrylic plastic sheet. An alternative may also be a framed thin plastic or glass sheet.



The Fabricated SUNSTOVE solar cooker was designed to be mass produced with hand tools and materials that are available in every country. The unit is affordable (materials cost less than USD $10.00) and it weighs under 5 kilograms, thus is easy to move or store (it hangs easily on a wall). It cooks 5 to 6 liters of food for a family. It is high quality, weather resistant, and user friendly. The SUNSTOVE stacks (nests together) for low-cost packaging and shipping. (Ten fit in the back seat of a car.) The unit is an ideal cottage industry because it does not require expensive machinery or facilities. It uses local materials, and only needs hand tools to manufacture.

Tools:

Hand riveter and rivets; industrial stapler and staples

Hand staple gun and staples; hammer and large tacks

Screwdriver, wood screws, nails, and paint brush

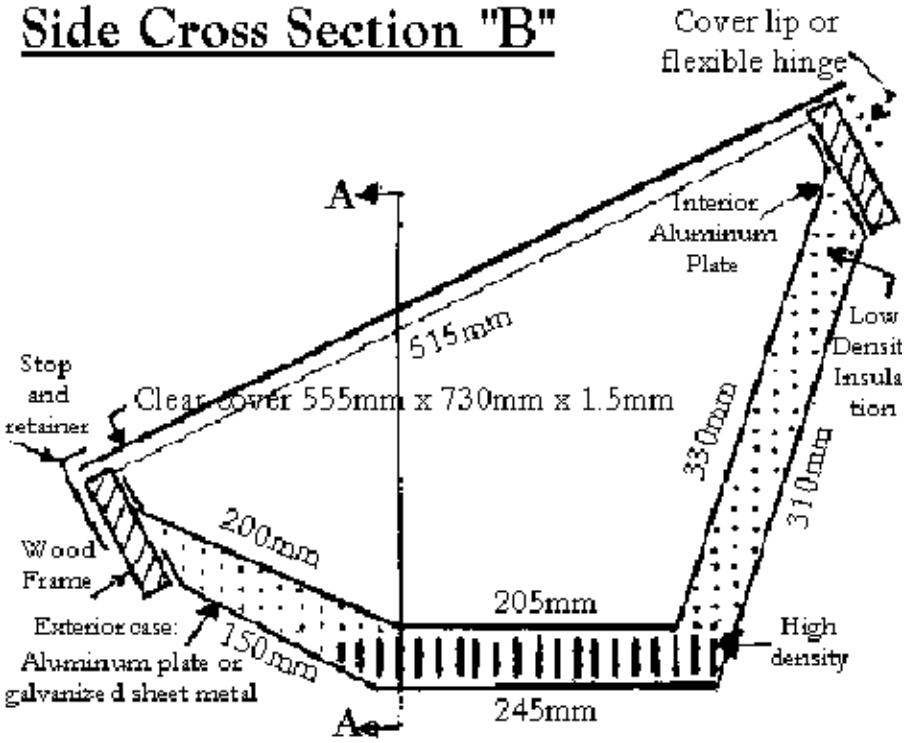
Tape measure, wood saw, tin snips, scissors, knife

THE KEY: Scrap Aluminum, Lithograph Printing Plates

They are available from newspapers or commercial printers and the government press in every country for the price of scrap aluminum. A reflecting interior wall and exterior case can be fabricated from these plates. They reflect the sun's rays to the cooking pots, will not rust and, painted black, they absorb and retain the sun's energy. Best of all they are low cost. A common size is 770mm x 1030mm (30" x 40"). Different sized plates can be riveted together or the cooker can be designed to use the plates available in any country.

Frame:	Wood, 90mm wide, 20mm thick, cut to length
Cover:	1.5mm medium impact acrylic or polycarbonate sheet (Note: Plastic film or 3mm glass require frame)
Stops:	Recommended method: Three L-shaped metal or plastic stops/retainers, two at bottom, one on side (see drawings) or:
Hinge:	Flexible impregnated fabric attached to cover with rivets and to wood frame with screws (see photo). Reminder: **STOPS ARE RECOMMENDED**
Interior:	Scrap aluminum printing plate, 770mm x 1030mm x 0.3mm thick, best size, see drawings for details
Insulation:	Fiberglass, jute, or mineral wool mat, rug, carpet, or scrap textiles, wool, cotton, etc.
Case:	Scrap aluminum printing plate, 770mm x 1030mm or 30- or 32-gauge galvanized sheet metal
Paint:	Black primer that will adhere to aluminum

IMPORTANT NOTE: MATERIALS AVAILABLE IN YOUR COUNTRY CAN BE SUBSTITUTED AND THE SIZE OF COOKER CAN BE CHANGED TO UTILIZE THESE LOCAL MATERIALS.

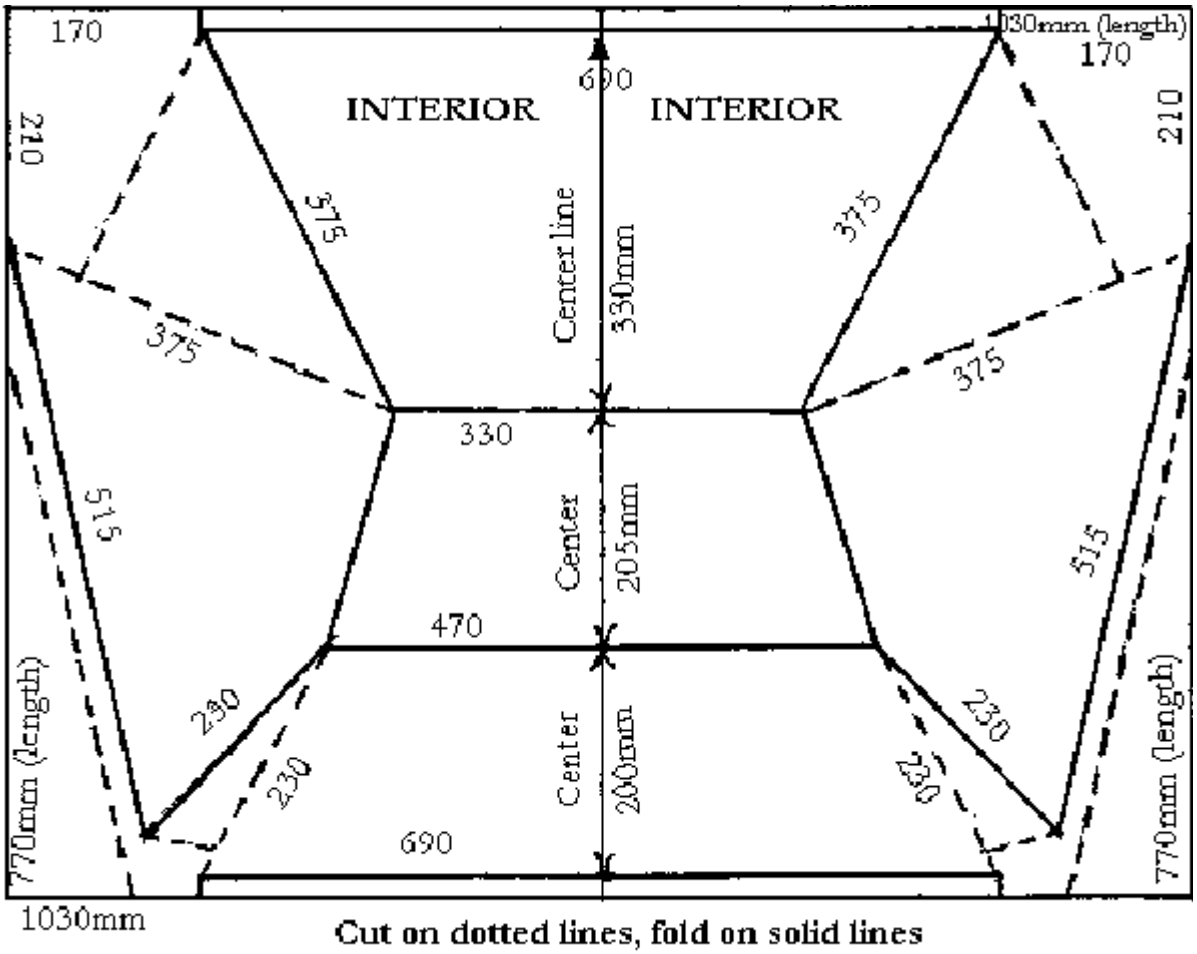


INSULATION:

Bottom: 40mm high-density mineral wool, jute, or fiberglass 50 kg/cu.M or isocyranurate foam. Insulation supports weight of food. Rug or carpet second choice. Scrap textiles, raw wool, or cotton need spacers between interior wall and case.

Sides: 40mm low-density fiberglass, mineral wool, jute blanket 12 kg/cu.M will conform to the irregular shape of the sides. Textile cuttings, blanket, rug, or carpet will remain vertical on sides.

Interior



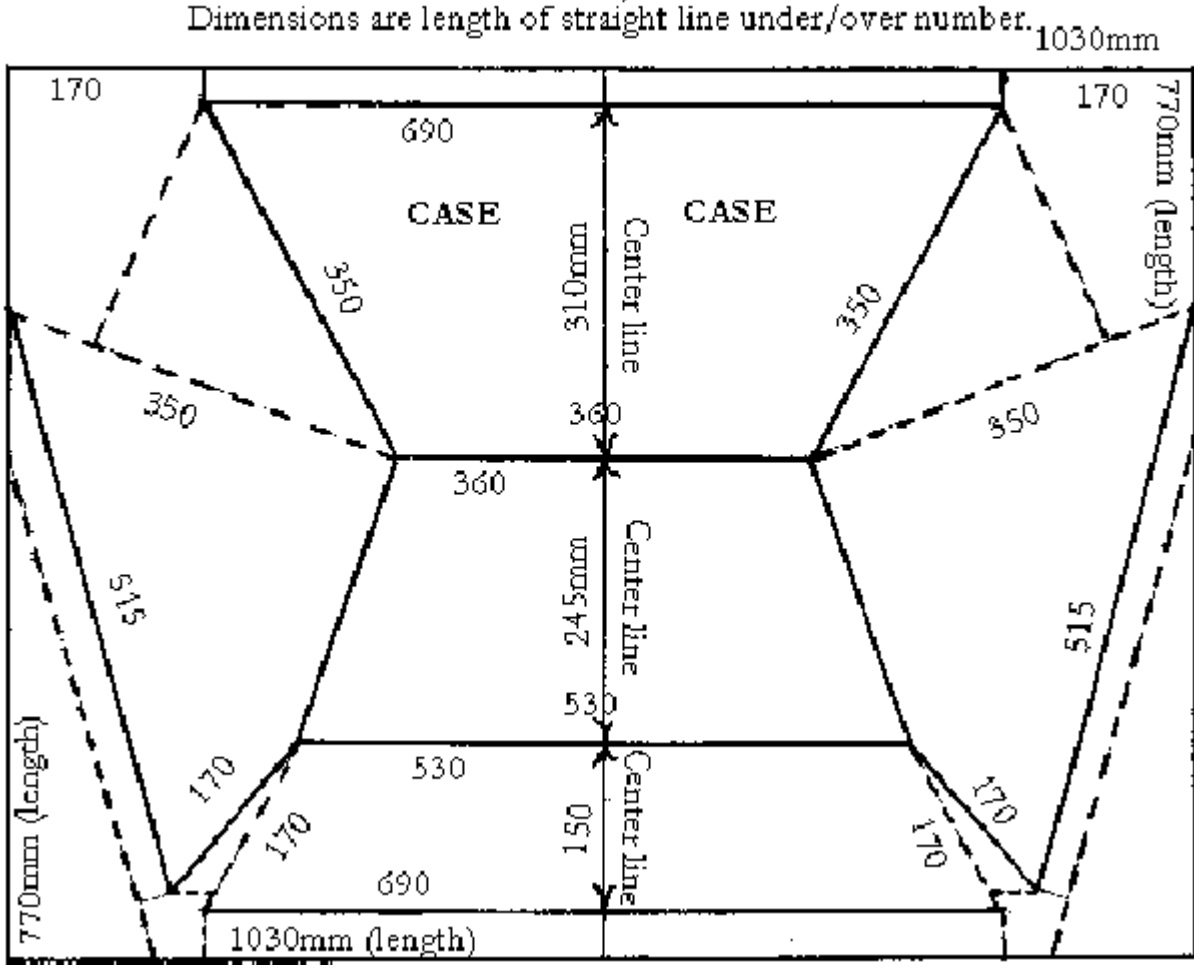
These drawings use a popular aluminum lithograph plate from a #102 Heidelberg press, 770mm x 1030mm x 0.3mm. This and other sizes are available from government and commercial printers or newspapers. They are sold for the price of scrap aluminum, about $1.25/kilo. Staple or rivet small plates together to make any size unit. We can help design cookers for other plate sizes.

Note: 30- or 32-gauge galvanized steel, stainless steel, or sheet metal painted with a reflective paint will work. Sheet metal costs and weighs more and is harder to cut and bend than printing plates. Sheet metal does make a stronger case.

Case

Cut on dotted lines, fold on solid lines

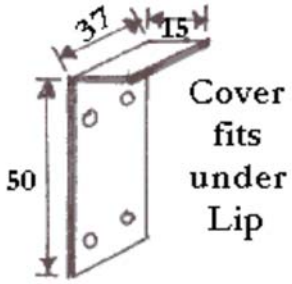
Dimensions are length of straight line under/over number.



COVER:

1. Medium impact acrylic* or polycarbonate sheet, 730x555x1.5mm

A. With Stops
Stops -- Metal or plastic "L's
50mm x 15mm x 1mm thick
2 at bottom, 1 one side; see drawings and views.



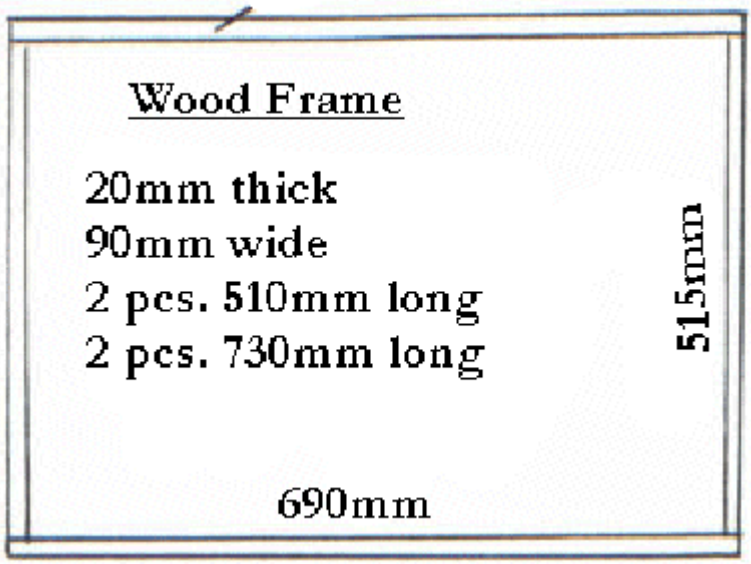
B. With Hinge
Weather resistant, flexible, reinforced, non-fraying material riveted to cover and screwed to frame.

C. Cover with Top Lip: 730mm x 600mm plastic sheet. The extra 45mm forms a lip. 2 stops on bottom.

**** Recommended system, see views for details***

2. Thin UV-resistant plastic film or **3mm glass** require a frame to hold the film or to protect the glass from breaking. The frame can be held with stops or hinged to the wood frame of the cooker.

3. Clear Cover, 730 x 555 x 1.5 or 3mm, modified acrylic, polycarbonate, film, or glass (must be framed)



Dried lumber 90mm x 20mm cut to length. Paint to protect from weather and warping. **Use long screws to hold boards solidly together.**