

Making Petals of Solar Cookers With Mylar and alveolar PP sheets - Coroplast

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Introduction

Most solar cookers are made with expensive reflective materials, like ultra polished aluminum sheets. It is not easy to find this material also. A good and cheap alternative to it is to make petals and sides of solar cookers (parabolic or panel types) with Mylar and alveolar PP plastic sheets (also called Coroplast overseas, and Polionda in Brazil). This paper will make a review about that

About plastic reflexive materials

We have much options with plastic reflexive materials. Thickness of sheets is the first thing to consider. We have very thin plastic films with good reflective properties. It is called BOPP (bi orientated Polypropilen), it is used in emergency blankets and also in potato chips bags. This thin films must be glued and fixed with care to avoid wrinkles, in other thicker sheets to better rigidity. This material is cheap, sometimes cents of dollar per square meter.

Other thicker plastic film usually has thickness of .20 or .25 mm, and is a PVC or PET sheet coated with very reflective material, almost a plastic mirror. It is more expensive than BOPP, but more reflective too, and easier to work. If glued in a Coroplast base we will have good results.



Fig 1 - Thin cheap plastic reflective films - BOPP



Fig 2 - Thicker plastic reflective films – PVC and PET metalized coated - .25 mm thickness



Fig 3 – A 16 petals 1.2 m diameter parabolic SC with Coroplast and Mylar glued

About procedures of gluing Coroplast sheets with Mylar

You must have a pattern of the petal or side of SC. So, it is necessary to cut the Coroplast sheet and the reflexive Mylar in the same size. Just glue both like a sandwich. The base is Coroplast. To join the reflexive material (Mylar) will be necessary double sided tape and transparent PVA glue (special – does not wrinkle).

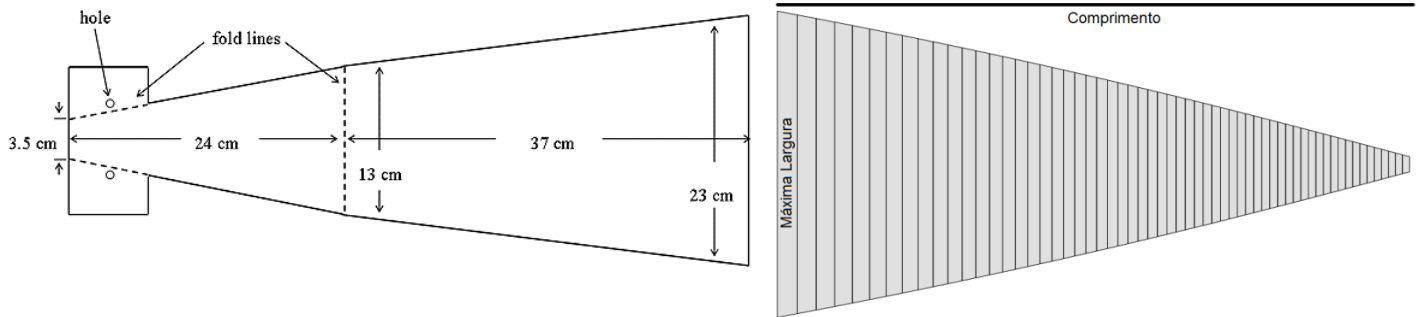


Fig 4 – Patterns of petals or sides of DATS and parabolic SC

To avoid wrinkles, you must use double sided tape in the edges of petals, and some glue, with care. BOPP material is so much thin, so special attention. Two persons must stretch the film to let it in the right position. Mylar of .25 mm is easier to work. The film must be positioned with care over the Coroplast sheet. Two persons are required for better results.



Fig 5 – Fun Panel SC side with double sided tape (gray) and glue line (ambar)

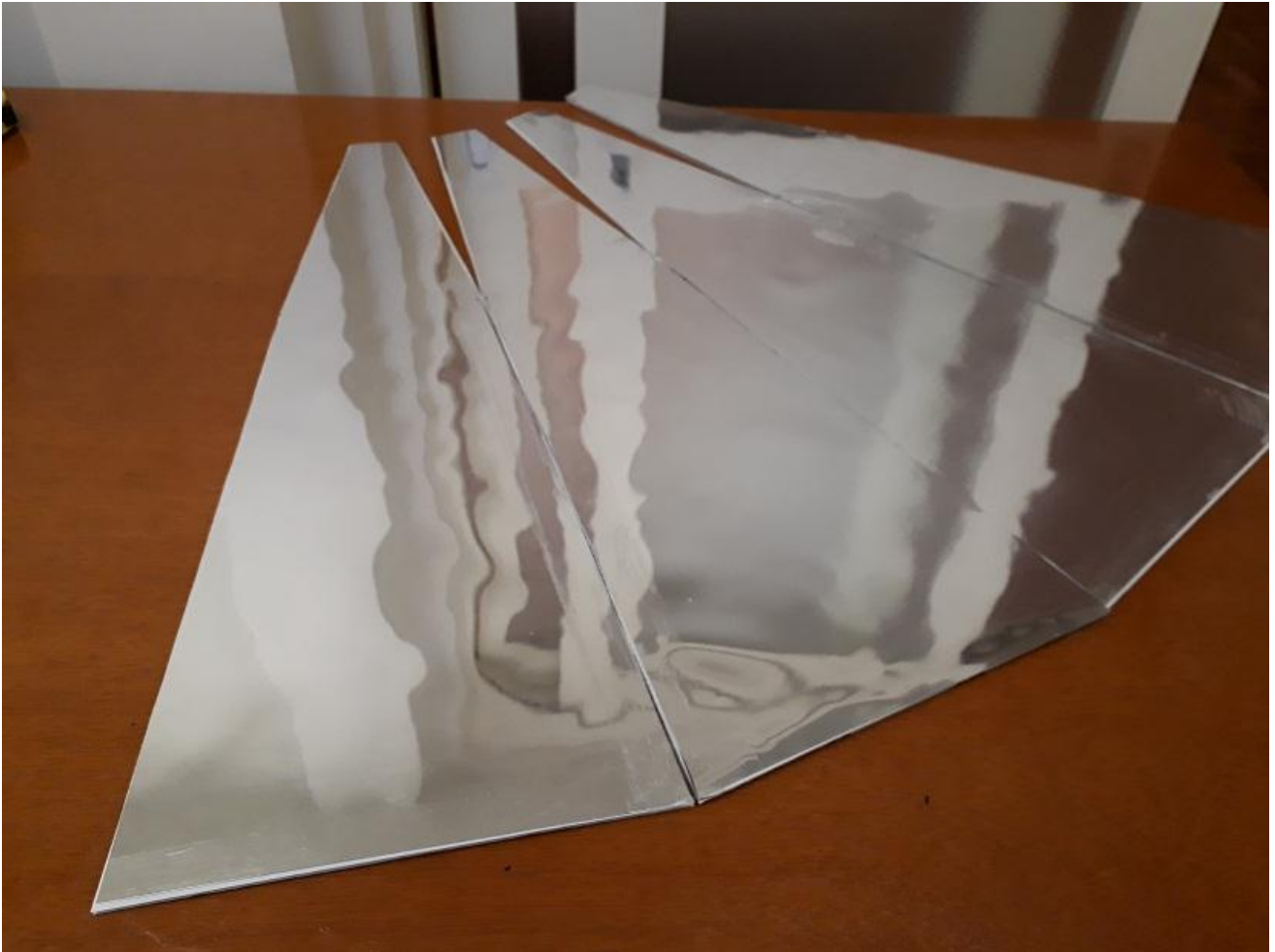


Fig 6 – Four petals of DATS SC. Can be joined with tape or plastic zip ties



Fig 7 – Mylar reflective film – thickness of .25 mm



Fig 8 – Low cost no adhesive Mylar roll reflective film – thickness of .25 mm



Fig 9 – Detail of a Fun Panel SC with Coroplast glued with Mylar



Fig 10 – Detail of a Jumbo Fun Panel SC with Coroplast and Mylar. Must be opened with ties

About procedures of joining the petals of the solar cooker

To join the petals or sides of a solar cooker, you have some options, depending on durability and design. You can use 45 mm transparent plastic tapes, like Scotch, **in alternate way**, to fold like an umbrella. In this case you must reinforce with double layer tape. Other alternative is using 2.5 mm zip ties in three points or more of each petal. This option looses in aesthetics but is better in rigidity and stability of the SC. Zip ties makes a more durable SC. I use it most, and recommend it.



Fig 11 – Detail of using zip ties to join petals or sides of SC. Zip “heads” stay outside

About procedures of aluminum reinforcement of the solar cooker

Of course when we use Coroplast in a SC we must reinforce it to better rigidity and stability. In a DATS (12 petals parabolic segmented SC) or a 16 petals parabolic SC a 60 cm diameter round aluminum ring (1/8 X 1/2 inch) must be provided, also tied with the petals with zip ties, to let the SC stable, with wind resistance. In this ring you can use bolts to provide the rotating of the parabola, or a connection with the base of the SC. I advise the base can be in 40 mm white PVC tubes.

Links to a great parabolic solar cookers:

<http://www.instructables.com/id/Parabolic-solar-oven/>

<http://www.earthboundtech.com/eb-hypar-cooker> .

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This article is according the “**Faro Declaration Of Intent**”, promoting Solar Cooking overseas.