# *Making an Inexpensive Filter Cell for BAADER AstroSolar™*

**The film must be mounted reasonably flat and free of any tension. It is more desirable to have slight wrinkles than to stretch the material, which will damage the optical quality and possibly the coatings. Wrinkles, creases and folds in the material are normal and will not affect the function and performance in any way.**

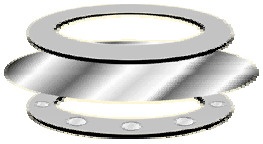
## *The "Cylinder"*

Construct a cylinder out of posterboard to fit over the front aperture of your telescope or dewcap. Start by cutting several long strips of the posterboard approximately 2" wide and wrap these around the lens cell or dewcap until you have 3 or 4 layers. Glue the layers to each other to form a thick, sturdy cylinder approximately 1/4" thick (do not glue this to the scope, please!). The finished cylinder should fit snug on the scope yet slide easily on and off.

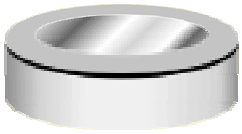
***Hint:*** For small aperture telescopes, you might be able to find just the right-sized cardboard tube to fit over the aperture. Simply cut off 2" and use that as your cylinder. If the tube is slightly too large, use an adhesive felt liner or cork pads to make it fit snuggly.

## *The "Filter Cell"*

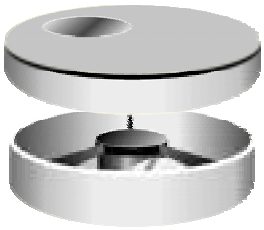
Cut out two rings of posterboard or cardboard with the outer diameters equal to your fabricated cylinder. The inner diameter should correspond to the actual aperture of your telescope. On one side of each ring near the outer edge, attach a number of pieces of double-sided tape.



Now comes the tricky part – how to get the AstroSolar™ film onto the taped ring without wrinkles or ripples. The film must not be scratched. So, put one sheet of Kleenex™ (or other soft tissue) onto a flat table. Tape the tissue onto the table so that it is stretched out evenly and cannot move. Now put a square piece of AstroSolar™ material (slightly larger that the outer diameter of the cardboard rings) onto the piece of soft tissue. Do not tape the film and do not stretch it! Just let it rest relaxed and flat on the tissue.



Now, take one of the cardboard rings with the sticky tape face down and lower it straight down onto the film until the entire ring has made contact with the film. Turn this assembly around and tape the other ring onto the opposite side of the film. Now you can trim away any overhanging parts of the film. Your AstroSolar™ film should now be free from strain and wrinkles, sandwiched between the two cardboard rings. Finally, glue this "filter cell" assembly onto your prefabricated "cylinder." Lift the filter up to the sky and inspect the cell for light leaks prior to using it on your telescope or binoculars. Use a black felt-tip marker to cover tiny pinholes in the filter material. Now your "do-it -yourself" filter is ready. Enjoy it!



When covering a larger Newtonian or Schmidt-Cassegrain Telescope for solar observation, it may be that "Less is More"! Do not try to make a filter as large as the telescope aperture. The bigger aperture will be greatly affected by air turbulence, which can ruin fine detail. We suggest that you produce an off-axis filter cell, to observe the sun with a smaller (but much improved) telescope.

## *Storing Your Filter*

It is very important to store your filter safely so that it will not be damaged. If the filter is small enough, we suggest that you use a plastic food storage container with a cover. In addition to protecting the filter material, it will keep the cardboard material from becoming wet and soft.
If your filter is damaged in any way, it must be replaced. DO NOT use if the AstroSolar™ material has any holes or the cell is weakened and will not stay on the telescope.

## *Please observe the following safety precautions with EVERY solar observation*

Prior to each and every solar observation session, check the filter's fit and, if necessary, tape it to the telescope to prevent slipping. Cover any pinholes with black felt-tip marker.

- NEVER use the filter at the eyepiece, it will burn up in less than a second! It will not filter out the concentrated and very dangerous light energy at the eyepiece end. Unfiltered solar light can and will cause blindness. The filter will ONLY work when attached to the FRONT aperture of a refractor objective, in front of the Schmidt plate (Schmidt-Cassegrain telescope) or in front of the tube of a Newtonian telescope.
- If you use a binocular, protect both objectives with a filter.
- Be sure that the viewfinder of your telescope is properly covered, either with a solar filter made as described above or with the original dust cover. Unprotected views through your finderscope would have the same catastrophic consequences for your eyes as a look through the main telescope itself!
- A filter made of AstroSolar™ filter material is relatively resistant to breakage in comparison to a glass filter. However, care should be taken with sharp pointed objects. A punctured filter should be thrown away and replaced with a new one (same as with a cracked glass filter).
- Emphasize the importance of safety to those observing with you, especially children. Intentionally removing or damaging the filter can endanger their eyesight. This is no place for jokes. Never leave the telescope outside unattended during the daytime!
- We recommend that you tape your filter directly onto your telescope to be sure that it does not come off by accident.

04-02-01