

DIY

White Light

Solar Filter

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Never point a scope other than a refractor directly at the sun without a solar filter. The rays from the unfiltered sun are very strong and generate a lot of heat. It will melt and deform plastic parts inside of a scope. It will also soften and melt the glue holding your secondary and other parts.

This is how to make a white light solar filter. It will allow you to see sun spots. It will not allow you to see prominences or flares. To see prominences or flares you need a Ha (Hydrogen Alpha) filter. To see both at once, you need a stack of 2 Ha filters.

Supplies for small scopes up to 6 inches:

1 or 2 sheets of 8" x 10" plastic, acrylic or polycarbonate. I recommend you use Lexan or other polycarbonate. Plain acrylic plastic is fairly brittle and breaks pretty easily.

6" x 6" or larger sheet of solar film (Seymour Solar or Baader Planetarium)

1 tube of silicone cement

Velcro (hook & loop) strips.

Something to use as a mounting ring, I use some flexible storm door weather strip.

Black felt tip marker (Sharpie)..

For larger scopes:

1 or 2 sheets of 8" x 10" plastic, acrylic or polycarbonate. I recommend you use Lexan or other polycarbonate. Plain acrylic plastic is fairly brittle and breaks pretty easily.

6" x 6" or larger sheet of solar film (Seymour Solar or Baader Planetarium)

1 tube of silicone cement

Velcro (hook & loop) strips.

1 sheet of craft foam board.

1 strip of thin wood strip 1inch (25mm) wide x 0.16 inches (4mm) thick. Measure the outside diameter of the OTA and increase it by 3 inches.

1 tube wood or craft glue

1 can black spray paint

C-clamps



In the plastic sheet mark a circle the size of the inside diameter of your OTA. For large scopes like DOB's and SCT's you can limit this to some place between 4-6 inches. Make a second circle approximately 3/4 of an inch outside the first circle, keeping it centered over the first circle.

Cut the outside circle and then the inside circle. Your objective is to end up with a plastic ring like this. We used a Dremil tool with a whole cutting attachment.



Trace the ring on to the remaining plastic sheet or second sheet and cut it out, giving you a second identical ring.

Lay a bead of silicone cement around one side of one of the rings. Then place the solar film on top of the silicone cement. Try keeping it flat and tight. Place a book or something flat with some weight to it to keep the film in contact with the cement and help spread it out. Let it dry 24 hours.

Cut the excess film off or the ring. Lay a bead of silicone cement around one side the remaining ring. Place the cement side down on top of the solar film glued to the ring. Once again place a book or heavy object in top of it and let it dry for 24 hours. Depending on the type of silicone cement you use, you should end up with something that looks like one of these.

Seymour Solar black film with white silicone.



Baader Planetarium silver film with clear silicone.



Make a circle out of something that will fit snugly over the end of the OTA, that you can use as a mounting ring. I used some foam filled vinyl flexible storm door weather strip and reformed it to a curve using a heat gun. You could probably use a hair dryer too. Glue the ends together and let it dry. Cover one side of the filter rings with Velcro. Put the other side of the Velcro on the outside of the mounting ring. Be sure and have the the Velcro ends met up so no light leaks in.



Take your black permanent marker and darken the outside of your ring and any silicone to prevent light leaks. Put your mounting ring over the end of the OTA and put the filter over the end of the mounting ring.





For a larger scope like an SCT or DOB make a 4 to 6 inch filter ring just like in the previous steps.

Take your strip of wood and soak it in a bucket with a couple of gallons of water with $\frac{1}{4}$ cup of bleach. Let it soak overnight until the entire strip of wood is wet and becomes pliable. Clamp the end of the wood strip to the open end of your OTA. Gently bend the wood around the OTA, placing a c-clamp every several inches. When the entire circle is complete let the wood toughly dry for several days.

Cut the end of the wood strip so the two ends can join. Cut as second piece 2-3 inches long. Glue the two ends of the long strip together. Place the short piece on the outside of the circle over the seam and glue it in place. C-clamp it in place and let it dry.

Place the wood circle over the craft foam board. Trace the inside of the wood circle on the craft foam board. Cut out the circle out of the foam, it should fit snugly inside the wood circle. Cut a circle out of the foam board the same size as the inside diameter of the filter ring. Glue the foam board into the wood ring and let it dry. I laid a bead of silicone around the entire seam and smoothed it out with my finger, let it dry overnight. Spray paint the wood ring and foam board black. After the paint dry's place Velcro on the inside of the foam board and on the filter ring like on the previous steps. The filter ring should attach with no light leaks.



The solar filter should slide over the end of your OTA. If it doesn't stay on you could glue some felt on the inside of the wood so it fits snugly.

This is the finished solar filter for my 11 inch SCT. Because the sun is so bright, it does not matter if you stop it down to 4-6 inches. Never point a scope directly at the sun without a solar filter. The rays from the unfiltered sun are very strong and generate a lot of heat. It will melt and deform plastic parts inside of a scope. It will also soften and melt the glue holding your secondary and other parts.

