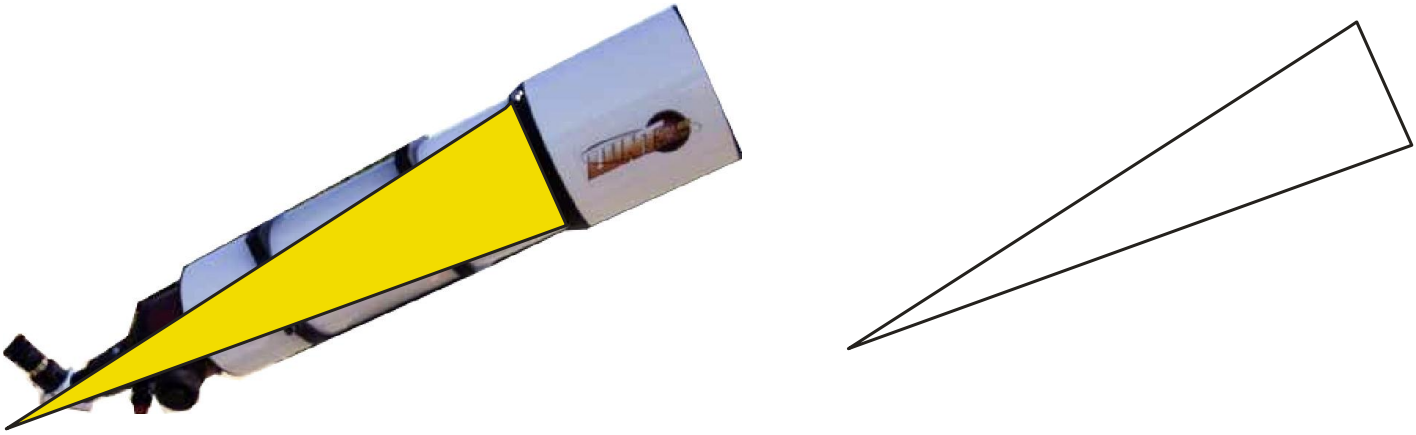
Why are there different size blocking filters for H-Alpha?



Light cone of Lunt LS152mm

Without going into a lot of optical mechanics and technical detail, the light cone is of lessening width the farther away you go from the objective lens. The distance from the objective at which you attain focus with the many different devices used on a telescope is significantly different. For example, your eye, a camera, a binoviewer, etc... all require the blocking filter assembly to be moved significantly up and down the light cone in order to reach focus.

The pictured telescope on the left has a standard eyepiece in it so that the scope is focused for visual use. Remember the light cone is deflected 90 degrees by the diagonal and your eye is a few millimeters away from the eyepiece thus adding more distance from the objective. For visual use, the manufacturer's smallest blocking filter listed for use with each of their different scopes will allow for the entire light cone to pass through the blocking filter without any significant loss of edge detail. Of course the best part of any optical surface is a little bit away from where it is attached to its housing so if you buy the smallest blocking filter you can find and expect to zoom in on features, you will see some edge loss of light and possible aberrations inherent in any optical edge. A larger blocking filter will also allow for the use of eyepieces with larger field stop diameters without any vignetting in the field of view.

A camera or a binoviewer requires something we call "in-focus". This means that you will have to move the blocking filter significantly closer to the objective in order to reach focus. If you have a 6mm blocking filter on a Lunt 60mm scope and you want to use a DMK camera or the like to image with you will have to move the blocking filter assembly in about 3 inches. You will then be dealing with a larger than 6mm light cone at that point and you cannot possibly get all the information that the objective is sending to your device as it is cut off around the edges. This is why they recommend the B1200 for this application, so that the entire light cone will fit through the usable portion of the blocking filter. You may have seen it referred to as the imaging package on their site.

A binoviewer requires significantly more in focus than a camera and generally cannot be focused at all without the aid of a Barlow on most available solar scopes. There are some models that will allow for this like the Coronado SolarMax II 90mm but be aware that the binoviewer assembly is so large it pushes the eyepiece a lot farther back from the focal point of the scope. Therefore you have to move the blocking filter much closer to compensate and attain focus. In other words, you will need a larger blocking filter for binoviewer use.

Question and answers:

Q. Does it change the image quality any?

A. No, but there are variances between individual specimens of the same exact model blocking filter from every manufacturer as they are all hand assembled and polished, aligned, etc…

Q. What does a larger blocking filter do to visual use?

A. It gives you more blank space around the Sun and allows for further magnification before the image hits the edge of the field of view.

Q. Do I have to use the blocking filter or can I come up with some sort of homemade stuff that will do just as good.

A. How much do you value your eyesight? Use the products as designed.

Q. Why is this stuff so expensive?

A. There is not a very large market for these scopes and they are all painstakingly handmade. The more we all buy them the cheaper they will become. This is the golden age for amateur solar astronomy and it has become significantly cheaper and higher quality in the last ten years. Please don't go for the cheapest option, you will regret it. This is not a washing machine or set of tires you are buying.

I encourage you all to share this hobby with others if you are fortunate enough to own one of these scopes.

Stephen W. Ramsden
www.solarastronomy.org