INSTRUCTION MANUAL

Orion® E-Series Safety Film Solar Filters

#7784, #7785, 7786

ORION®

TELESCOPES & BINOCULARS

Providing Exceptional Consumer Optical Products Since 1975

OrionTelescopes.com

Customer Support www.OrionTelescopes.com/contactus

E-mail: support@telescope.com

Corporate Offices: 89 Hangar Way, Watsonville, CA 95076

IN 485 Rev. B 03/17

Our E-Series Safety Film Solar Filters are a low cost but completely safe alternative to our aluminum cell and glass filters. They can be used on telescopes, binoculars, monoculars, cameras and finder scopes to safely view and photograph the Sun. Unlike some other solar filters, the black/silver polymer used in E-Series solar filters will provide a pleasing natural yellow-orange image of the Sun. The actual filtering properties are protected within the polymer itself.

This filter material (ND5 density) transmits less than 0.001% of sunlight through the telescope. That might not sound like much, but it's just enough to see the Sun in its full glory while keeping your eyes safe from its harmful, intense radiation. Do not use a filter that shows any form of defect, such as pinholes or scratches. Please contact us for further return instructions. All solar filters are covered by a limited liability warranty from defects in material and workmanship.

DANGER! Viewing the Sun through any optical instrument without a correctly inspected and installed solar filter can cause immediate, permanent eye damage and blindness!

Solar viewing is safe only if you understand the potential dangers and follow all directions. Read these instructions carefully and save them for future reference. Do not allow children or inexperienced adults to use the telescope or solar filter unattended.

How to Size a Filter to Fit Your Telescope or Binoculars

Your solar filter cell fits over the front of the telescope, finder scope, or binoculars. When selecting a filter for your instrument, measure the outside diameter (O.D.) of the tube where the filter will be installed and choose the filter size with inside diameter (I.D.) slightly larger than the tube's O.D. Do not choose a filter the same size as your O.D. This will be too tight and not allow room for the felt lining that you will use to snugly fit the filter to your instrument. You want a snug fit to prevent the filter from accidentally slipping off while in use, which could cause serious eye damage. One or more strips of adhesive felt are included with the filter. Cut one or more small strips as needed and apply to the inside of the filter cell (remove the backing to expose the adhesive) to achieve a secure fit.

Using the Solar Filter

1. Check the filter's optical surfaces for any possible damage before each use. The view through your telescope should be comfortable and not appear excessively bright. Stop looking immediately if the view is excessively bright!
2. Keep the front of any finder scope covered if it is not equipped with a solar filter. Better yet, remove the finder altogether when observing the Sun. An

WARNING: ***Never look directly at the Sun through your telescope—even for an instant—without a professionally made solar filter that completely covers the front of the instrument, or permanent eye damage could result. Young children should use this telescope only with adult supervision.***

uncovered finder scope is dangerous to look through. Even if you do not look through it, unfiltered sunlight may melt internal parts of a finder scope.

3. To aim a telescope with solar filter installed at the Sun without aid of a finder scope, you can use the shadow cast by the telescope as a guide. Point your telescope in the general direction of the Sun, and watch the shadow cast by the telescope tube on the ground. Move the tube gradually back and forth, up and down until the shadow is the smallest it will get. The Sun should then be visible in the eyepiece field of view.
4. Allow the telescope and filter to equalize to outside temperature for at least 15 minutes.
5. Direct sunlight may warm the tube assembly enough to cause internal heat currents that can degrade image quality, especially on dark-colored telescopes. Cover the tube assembly with a light-colored cloth to help avoid this.
6. If possible, do not view over pavement or buildings. Viewing over grass will help avoid surface heat currents.
7. Point the telescope away from the Sun before removing the solar filter! Removing the filter while the telescope is aimed at the Sun is dangerous if anyone is looking into the eyepiece, and can damage the telescope if left pointed at the Sun, unfiltered, for too long.

CAUTION

Do not use a filter that shows any form of defect such as pinholes or scratches. If you see or suspect a defect, please contact us for return instructions.

Observing Solar Eclipses with E-Series Filters

Whether using a telescope or binoculars for viewing a solar eclipse, there are a few things to keep in mind:

1. Make sure the solar filter fits snugly on the front end of your instrument. For binoculars, you'll need one filter over each of the two front lenses.
2. During all of the partial phases of a solar eclipse, the solar filter(s) must be covering the front of your instrument.
3. Only during the brief "totality" portion of a total solar eclipse - when the Moon completely covers the Sun's disk - is it safe to remove the filter and view without it.
4. Be ready to stop viewing and re-install the filter the moment the first glimmer of the Sun's disk re-appears, signaling the end of totality.

Solar Photography

E-Series Safety Film Solar Filters can be used for both visual observing and photography. By attaching a camera body to a telescope, in effect using the scope as a telephoto lens, you can take striking photographs of the Sun. Only attempt this if the telescope is equipped with the proper solar filter.

One-Year Limited Warranty

This Orion product is warranted against defects in materials or workmanship for a period of one year from the date of purchase. This warranty is for the benefit of the original retail purchaser only. During this warranty period Orion Telescopes & Binoculars will repair or replace, at Orion's option, any warranted instrument that proves to be defective, provided it is returned postage paid. Proof of purchase (such as a copy of the original receipt) is required. This warranty is only valid in the country of purchase.

This warranty does not apply if, in Orion's judgment, the instrument has been abused, mishandled, or modified, nor does it apply to normal wear and tear. This warranty gives you specific legal rights. It is not intended to remove or restrict your other legal rights under applicable local consumer law; your state or national statutory consumer rights governing the sale of consumer goods remain fully applicable.

For further warranty information, please visit **www.OrionTelescopes.com/warranty.**

Orion® Telescopes & Binoculars

Corporate Offices: 89 Hangar Way, Watsonville CA 95076 - USA

Customer Support: **www.OrionTelescopes.com/contactus**