

Astronomical Eyepieces and Filters Set



 **OLIVON™**

INSTRUCTION OF EYEPIECES AND MAGNIFICATION

Telescope eyepieces, in conjunction with the focal length of the telescope you are using, determine the amount of magnification you can achieve. The greater difference between the focal length of the eyepiece and the focal length of the telescope is the magnification. A simple formula to determine magnification is:

Magnification(x) =

$$\frac{\text{Telescope Focal Length (mm)}}{\text{Eyepiece Focal Length (mm)}}$$

When considering magnification, be sure to check your telescope's maximum useful magnification. Magnification beyond an instrument's maximum useful magnification gives into a blurry image and does not magnify the image any further.

FINDING CELESTIAL OBJECTS

When using eyepieces, you will discover that it is easier to find objects when using a lower magnification. When using a variety of eyepieces, start with a low magnification (long focal length) and work your way up to a higher magnification to fine tune your focus with each new eyepiece. When searching for an object, find the object with an unfiltered eyepiece first. Once the object you would like to view is centered in the eyepiece, remove the eyepiece and attach the filter. For some objects, a filter will reduce the image brightness enough to cause difficulty in locating an object.

EYEPIECE DESIGNS

KELLNER

The three element design of Kellner eyepieces provides sharp images at low powers. Included with most small and medium sized telescopes, Kellner eyepieces are some of the least expensive eyepieces available. With an apparent field of 40°, the Kellner design works well as a

www.olivonmanufacturing.com

multi-purpose eyepiece. The eye relief of Kellner eyepieces can become short at higher powers. Kellner eyepieces are great starter eyepieces.

ORTHOSCOPIC

Four element ortho eyepieces have a narrow apparent field which limits their usability. They have lost some of their appeal because of their narrow field. Ortho eyepieces feature better color correction, contrast, and image sharpness than Kellner eyepieces, as well as a longer eye relief, and are best used for planetary viewing.

PLOSSL

Like Ortho eyepieces, Plossls feature a four element design. Offering high contrast, edge-to-edge sharpness, and a 50° apparent field, Plossls are one of the best all around eyepieces. Plossls offer a balance between clarity, field of view, and cost. Plossls are the most popular design of telescope eyepiece because of their versatility.

ERFLE

Erfle eyepieces use a five or six element design to achieve a wider field of view than Plossl eyepieces. At low powers, Erfle eyepieces offer a great view of star fields. At high powers, images may lose some sharpness around the edges when viewed through an Erfle eyepiece.

ULTRAWIDE

Ultra wide eyepieces use six to eight elements to achieve apparent fields up to 85°. With such a wide field of view, viewing the entire image requires moving your eye around in the eyepiece. With the increased number of elements, the image viewed appears slightly dimmer than that viewed through other eye-pieces. The price of Ultra wide also tends to be higher than other designs due to the number of elements.

BARLOW LENSES

A Barlow lens is a special type of lens which halves the effective focal length of an eyepiece, thus doubling the magnification. For those familiar with 35mm photography, a Barlow is essentially the same as a doubler. Since a Barlow adds additional lenses to the optical system, the image viewed may appear slightly dimmer through a Barlow lens. A high-quality Barlow lens will greatly extend your range of viewing capabilities by effectively doubling the number of magnifications you can achieve.

ERECTING PRISMS

Erecting prisms correct an image seen through a telescope so that it appears right-side up. When navigating through the sky, an erecting prism may make telescope movement more intuitive for beginners.

OLIVON EYEPIECES FOR REFERENCE ONLY:

WAP SERIES: 58-degree 1.25 PL EYEPIECES

WAP-2.5	WA Plossl 2.5mm 58 degree 1.25"
WAP-3.8	WA Plossl 3.8mm 58 degree 1.25"
WAP-4	WA Plossl 4mm 58 degree 1.25"
WAP-5	WA Plossl 5mm 58 degree 1.25"
WAP-7	WA Plossl 7mm 58 degree 1.25"
WAP-8	WA Plossl 8mm 58 degree 1.25"
WAP-9	WA Plossl 9mm 58 degree 1.25"

UWA SERIES: 70-degree 1.25~ 2" EYEPIECES

UWA-3.5	3.5mm 70-degree 1.25~2" 8 elements
UWA-5	5mm 70-degree 1.25~2" 8 elements
UWA-8	8mm 70-degree 1.25~2" 8 elements
UWA-13	13mm 70-degree 1.25~2" 8 elements
UWA-17	17mm 70-degree 1.25~2" 8 elements

SWA SERIES: 80-degree 1.25" & 2" EYEPIECES

SWA-11	11mm Wide angled 80 degree 1.25"
SWA-16	16mm Wide angled 80 degree 1.25"
SWA-15	15mm Wide angled 80 degree 2"
SWA-20	20mm Wide angled 80 degree 2"
SWA-30	30mm Wide angled 80 degree 2"

UW SERIES: 70-degree 2" EYEPIECES

UW-26	26 mm Wide angled 70 degree 2"
UW-32	32 mm Wide angled 70 degree 2"
UW-38	38 mm Wide angled 70 degree 2"

PLOSSL SERIES: 1.25" PL EYEPIECES

4mm eyepiece	1.25"
6.3 mm eyepiece	1.25"
12.5 mm eyepiece	1.25"
20mm eyepiece	1.25"
25mm eyepiece	1.25"
32mm eyepiece	1.25"
40mm eyepiece	1.25"

BARLOW LENSES

2" 2x ED Barlow lens	Metal FMC
1.25" 2x metal Barlow lens	Metal FMC

USING FILTERS

Olivon Astronomical Filters attach to the telescope side of eyepiece barrels. Olivon Astronomical Filters will attach to www.olivonmanufacturing.com

any astronomical eyepiece with standard threading at the end of the barrel. To use a filter, remove the eyepiece on which you would like to use the filter. Looking at the end of the eyepiece which is inserted into the telescope's eyepiece receptacle, screw the desired filter clockwise into the eyepiece barrel. To remove a filter, turn the filter counterclockwise. Once the desired filter is attached to the eyepiece, insert the eyepiece into the telescope's eyepiece receptacle.

CARE OF YOUR EYEPIECES AND FILTERS

- I.** Store your eyepieces and filters in the included case or box when not in use. Always secure your eyepieces in your telescope.
- II.** Clean using a soft, lint-free cloth with optical lens cleaning solution or a lens pen. Protect eyepieces and filters from hard impacts such as dropping.

III. Store in a moisture-free area to prevent

IV. Warning

- Do not use telescope or finder scope to look at the sun without an appropriate solar filter.
- Make sure no screws are loose before using telescope.
- Do not drop, shake, or throw your eyepieces as doing so may damage the telescope or people around you.
- Objects in telescope may be farther away than they appear.
- Eyepieces and filters intended for external use only.

SOME NOTES ON ASTRONOMICAL FILTERS

Astronomical filters work by blocking out certain colors in the visible spectrum of light. A red filter, for example, will block out all but the red wavelength of light. If you look at an object which is primarily red while using a red filter, the object will appear very bright. Areas which are not red will appear more clearly because they contrast with the wavelength of light which is being passed by the filter.

When using filters, make note of the visible light transmission (VLT) of the filter you would like to use. The VLT is a number which describes the overall amount of light which is allowed to pass through the filter. The lower the VLT number, the dimmer an image will appear. Filters with a VLT less than 40% are not recommended for use on telescopes with an objective aperture of less than 6" due to the decreased image brightness.

Filters are sorted by the Kodak Wratten numbering system. Each filter is listed by its color and Wratten number. The Wratten numbers help to ensure similar results between different filters. The image should appear the same when viewed through any #82A Light Blue Filter, for example.

The following section contains the most commonly used astronomical color filters and some suggested uses for each of them.

Instruction of filters:



#12 YELLOW - 74%VLT

Yellow filters help greatly in viewing Mars by bringing out the polar ice-caps, enhancing blue clouds in the atmosphere, increasing contrast, and brightening desert regions. Yellow also enhances red and orange features on Jupiter and Saturn and darkens the blue festoons near Jupiter's equator.



#21 ORANGE - 46%VLT

An orange filter helps increase contrast between light and dark areas, penetrates clouds, and assists in detecting dust storms on Mars. Orange also helps to bring out the Great Red Spot and sharpen contrast on Jupiter.



#23A LIGHT RED - 25%VLT

Light red filters help to make Mercury and Venus stand out from the blue sky when viewed during the day. Used in large telescopes, light red sharpens boundaries and

increases contrast on Mars, sharpens belt contrast on Jupiter, and brings out surface detail on Saturn.



#56 LIGHT GREEN - 53%VLT

Light green enhances frost patches, surface fogs, and polar projections on Mars, the ring system on Saturn, belts on Jupiter and works as a great general purpose filter when viewing the Moon.



#82A LIGHT BLUE - 73%VLT

www.olivonmanufacturing.com

Light blue functions much the same as #80A Blue while maintaining overall image bright-ness. Light blue will also help to increase structure detail when looking at galaxies.



POLARIZING FILTER

Olivon polarizing filters are a great way to enhance astronomical viewing. Compatible with any standard 1.25-inch-format eyepiece, Olivon polarizing filters help to bring out contrast and definition in astronomical objects.

The **polarizing filter** reduces glare and is especially useful for viewing the moon.

You'll enhance your viewing pleasure with Olivon's polarizing filters!



CRYSTALVIEW: MOON & SKYGLOW FILTER

Moon & skyglow filters feature improved blocking of mercury-vapor light and higher transmission at critical hydrogen-alpha and hydrogen-beta lines than competing filters. Bright, light-polluted skies appear much darker, and the contrast between object and sky is improved significantly.

This contrast-enhancement effect is particularly apparent on nebulas. Unlike stars, emission nebulas give off light in a very narrow range of wavelengths. Moon & SkyGlow filters allow maximum transmission of the important wavelengths of hydrogen-alpha, hydrogen-beta, and doubly ionized oxygen-the ones most commonly emitted by nebulas. Views of galaxies and star clusters are also enhanced, although not as much.