



Vixen Optics' SSW ED Ultra Wide Eyepieces come in five focal lengths as of this review. All offer an 83°-wide apparent field of view and 13mm of eye relief.

IMAGE COURTESY VIXEN OPTICS

WE TEST Vixen's new eyepiece line

Gorgeous machining, high-quality optical components, and a few nice extras catapult these eyepieces to the top. **by Mike Reynolds**

If you've been an active observer for any length of time, you know how telescopes and accessories have evolved. We often concern ourselves with a scope's optical tube assembly, the quality of the primary optics, or its mount. And yet we often ignore the eyepieces. That's a shame because many "standard" eyepieces do not enable the telescope to realize its potential. Vixen's SSW ED Ultra Wide Eyepieces will.

Background

A mere 50 years ago, most observers considered simple Huygens or Ramsden eyepieces to be their standards. A few might have acquired a more advanced Erfle, Kellner, or even an Orthoscopic design. Like telescopes and mounts, eyepieces also have evolved significantly, and

many of today's eyepieces feature new and improved optical designs, glass, coatings, and manufacturing techniques.

Eyepieces have distinct features, including focal length (which determines the magnification) and apparent field of view — the angular diameter the eyepiece "sees." The larger the apparent field, the greater the true field of view through the telescope will be.

The apparent field of view has a range of 20°— considered a narrow field of view — to an extra-wide field of 100° or more. A small field of view reminds me of looking through a paper towel tube; you concentrate on the subject (usually a planet) but miss a lot of the universe around you. To gain a larger field of view requires a more sophisticated design, one that includes more elements (pieces) of high-quality glass.

Modern art

Vixen Optics has introduced a new line of eyepieces, the SSW ED Ultra Wide Eyepieces, which the company manufactures in Japan. These five eyepieces sport 1¼"-diameter barrels and include focal lengths of 14mm, 10mm, 7mm, 5mm, and 3.5mm, providing the observer with medium to high magnifications.

My initial inspection revealed superbly machined units that look great. Each has a color band, from the red 14mm focal length through the violet 3.5mm. The scheme follows the visual wavelength colors of red, orange, green, blue, and violet.

The eyepiece barrels have a machined recess as a safety in case the focuser's set-screw loosens. This well-conceived feature prevents the eyepiece from falling out of the focuser.

Each eyepiece has a high-quality rubber variable-height eye cup, which you adjust by twisting in and out. I found this mechanism both useful and easy to deal with. Also, the eyepiece barrels are hexagonal, thus ensuring an eyepiece will resist rolling when on its side. (I can't count the times I have set an eyepiece down and watched it roll.) I tip my cap to Vixen for this design.

Optically, these are seven-element eyepieces. Vixen notes that the units feature "high-transmission/low-dispersion lanthanum and exotic glass" with full multicoating on all lens surfaces and a special coating on the lens-connecting surfaces. The apparent field of view is 83°, which places it in the extra-wide category. Eye relief is a comfortable 13 millimeters.

I tested the eyepieces on an 8-inch f/5.9 Newtonian reflector (in which the eyepieces provided magnifications from 85x to 340x) and a 4-inch f/7 apochromatic refractor (50x to 202x). Each eyepiece fit in the telescopes' focusers with no problems; the reflector uses a set-screw to lock the eyepiece, whereas the refractor employs a compression ring to secure it.

I used the complete SSW set to observe the Moon, the Orion Nebula (M42) — specifically the Trapezium — and Jupiter. My observing conditions over several nights remained excellent, with steady seeing and good transparency.

Under the sky

As a solar system observer and college astronomy professor, I always relish exploring the Moon. My first test was on a 62 percent illuminated waxing gibbous Moon. I usually like starting with the Moon on any telescope or eyepiece I am testing because it literally seems to "illuminate" any quality issues. I found no problems with any of the eyepieces.

The 14mm SSW (I always start with the lowest magnification and increase) yielded an excellent image. Focusing was easy, and the image was sharp to the edge of the field of view. The terminator seemed to jump out at me in crisp, startling detail. As I progressed down to the 3.5mm eyepiece, I continued to enjoy superb views, although when I got to the 5mm and 3.5mm focal lengths, the views were not as crisp due to the weather conditions at my site.

Some amateur astronomers like to employ a Barlow lens as a part of their observing routine. I like to see how effective the combination of a Barlow and eyepiece is versus an equivalent magnification



As part of the author's test of the SSW ED Ultra Wide Eyepiece line, he pointed several telescopes at the waxing gibbous Moon. He started by using the lowest-power eyepieces, and then increased the magnification. He concentrated his view along the terminator, where detail is greatest. **JAMIE COOPER**

eyepiece, so I used a high-quality 2x Barlow lens with the eyepieces. I compared the 14mm eyepiece with the 2x Barlow to the 7mm eyepiece, and the 10mm with the 2x Barlow to the 5mm eyepiece. The two eyepieces noticeably outperformed the eyepiece/2x Barlow combinations. I have not always found this to be the case. This test clearly demonstrates the quality of Vixen's shorter-focal-length eyepieces.

I also observed the Cold Winter Moon, as December's Full Moon is called. I know most will think this is crazy (this phase of our satellite shows the least amount of detail), yet it allows me to see flaws in the optics. At higher magnifications — where the amount of light coming through an eyepiece is less than through lower powers — features on the Full Moon can look great. Through the 4-inch refractor, I

found the views both excellent and enjoyable, although the image the 14mm provided was a bit bright for me.

The Orion Nebula can be a real test for optics, from the subtle patterns of its nebulosity to the faint point sources of the Trapezium, a tiny star cluster. I examined both carefully, and the eyepieces did not disappoint. The nebula's delicate wisps were crisp at the set's lower powers and not bad at the higher ones despite the softening sky conditions. I resolved the Trapezium easily at all magnifications and recorded in my observing notebook a view that was "quite delightful!"

Jupiter was my final test. The jovian cloud belts appeared distinct, especially with low powers. I repeated my Barlow/non-Barlow comparison described earlier. I much preferred the non-Barlowed views; the images were noticeably sharper and brighter.

PRODUCT INFORMATION

Vixen SSW ED Ultra Wide Eyepieces

Focal lengths: 3.5mm, 5mm, 7mm, 10mm, and 14mm

Size: 1¼"

Eye relief: 13mm

Apparent field of view: 83°

Price: \$349 each

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Top marks

If you're in the market for a set of well-made and outstanding quality medium- to high-magnification eyepieces, I wholeheartedly recommend the new Vixen SSW ED Ultra Wide Eyepieces.

My tests convinced me that these eyepieces deliver excellent images at all magnifications. You'll enjoy high-magnification views of the Moon, planets, and nebulae, and take full advantage of your high-quality telescope. ▶

Mike Reynolds is a contributing editor of *Astronomy*, a college professor, an author, and an equipment guru. He observes near Jacksonville Beach, Florida.