

Vixen's new refractor outperforms its specs

The AX103S offers fine craftsmanship and superb optics in a small package.

by Glenn Chaple

Being a budget-minded individual, I usually work with lower-end telescopes. For this review, however, I decided it was high time to try out a luxury instrument. My road-test vehicle has a name with a sports car ring — the AX103S. This 4-inch (103 millimeter) apochromatic refractor from Vixen Ltd. is to the backyard astronomer what a Porsche or Ferrari would be to an automobile fancier.

First impressions and features

The AX103S has the sleek, shiny look of a high-performance sports car — a gleaming pearl tube embossed with red lettering. Its maker, Japan's Vixen Ltd., has produced high-quality telescopes for more than 60 years.



The optical system of the AX103S employs a three-element objective lens and adds a fourth element — a field corrector lens — within the tube. Vixen multicoats all optical surfaces.

The AX103S uses a different lens than achromatic refractors that were prevalent decades ago. Unlike an achromat, whose objective consists of two optical elements, the Vixen AX103S has a three-element objective.

The central lens boasts extra-low dispersion (ED) glass designed to reduce chromatic aberration (colors focusing at different points) and improve image contrast. A fourth optical component — a field corrector lens positioned toward the rear of the tube — ensures sharp images across the field of view.

Features I appreciated include the dual-speed rack-and-pinion focuser and the retractable dew shield. When retracted, it reduces the tube's overall length from 30 to 27 inches (76 to 69 centimeters).

Under the stars

First light with the AX103S was a star test using brilliant Vega (Alpha [α] Lyrae). A high-power view revealed a crisp, tight image of the star with no chromatic aberration. Images inside and outside focus indicated flawless optics.

The four components of the Double Double (Epsilon [ϵ] Lyrae) stood out sharply, even through a 2.5mm eyepiece (330x). This magnification is well above the theoretical upper limit for a 4-inch scope. I was amazed at the ability of the AX103S's f/8 optics to handle such high magnification.



The Moon looked impressive through the AX103S, its features etched sharply across the field of view. With high anticipation, I turned to Jupiter, rising above the treetops. Although atmospheric turbulence at that altitude muddled the image, no color fringes surrounded the planet's disk. Clouds dashed my hopes of viewing this planet when it stood higher in the sky — a weather pattern that plagued me for much of the time I had allotted to the AX103S review. At times, I felt like someone trying to test-drive a convertible during a rainstorm!

I was able to explore a few deep-sky objects. A view of globular clusters M4 and the Hercules Cluster (M13) revealed sparkling stellar spheres. The Ring Nebula (M57) was definitely annular, contradicting my one-time belief that its "ring-ness" could be seen only through

Contact information

Vixen Ltd.

1023 Calle Cordillera
Unit C

San Clemente, California 92673

[t] 949.429.6363

[w] www.vixenoptics.com



Vixen Ltd's AX103S is a high-quality 4-inch apochromatic telescope with an f/8 focal ratio. Its superb optics allow high-magnification views.

All equipment photos:
Astronomy: William Zuback

larger telescopes. A comparative view through my trusty 4.5-inch reflector showed just a ghostly oval. Now I know why many amateur astronomers gravitate to apochromatic refractors.

As for light-gathering ability, the AX103S can go deep. An accompanying pamphlet gives the instrument's limiting magnitude as 11.8. Not so! Checking out stars of known brightness around the variable star SS Cygni, I saw a magnitude 12.3 star without using averted vision.

Because I reviewed only the optical tube assembly, I needed to add a mount. I easily affixed the AX103S to a budget mount I own. The setup worked fine for low-power views, but it wasn't always steady enough for the high magnifications the AX103S is capable of reaching. Should you purchase this optical tube assembly, you'll want to place it on a premium mount.

Vixen sells complete AX103S packages that serious observers will appreciate. The packages include one of the company's high-quality mounts, a 7x50 finder scope, a flip-mirror diagonal, and a Vixen eyepiece.

A testament to the razor-sharp optics of the AX103S came not in the course of nighttime observing, but during a daylight test by my friend Bill Pothier. Bill aimed the telescope at a steeple atop his backyard barn. Using a 4mm eyepiece (206x), he clearly saw the

threads on an exposed bolt. He was admiring the sharp detail when he noticed movement — an ant. From a distance of 70 yards (64 meters), Bill could tell that the ant was missing an antenna.

In a word, superb

So how do I feel after test-driving a "Porsche"? Spoiled! There's still a place for my budget scopes, and they serve me well. But on those nights when the seeing and transparency are optimal, I'll wish I were behind the wheel of an AX103S.

Should you count yourself among the ranks of veteran skygazers who feel it's time to cruise around the universe in style, give serious consideration to purchasing Vixen's AX103S. It's a telescope that, if properly cared for, will last a lifetime. ☺

Product specifications

Vixen AX103S

Type: Apochromatic refractor

Aperture: 4 inches (103 millimeters)

Focal length: 825mm

Focal ratio: f/8

Weight (tube assembly): 10 pounds
(4.6 kilograms)

Cost: \$2,999



The dual-speed 2" focuser Vixen includes with the AX103S allows both coarse and fine adjustments.

Glenn Chaple is an Astronomy contributing editor and columnist.