

Testing Sky-Watcher USA's new refractor

A nice package, great performance, and a reasonable price combine to make this 4.7-inch telescope a winner. **by Phil Harrington**

Since they first hit the U.S. market some 10 years ago, Sky-Watcher USA telescopes have become synonymous with great value. Whether you're talking about refractors or reflectors, these high-quality instruments promise real bang for your observing buck.

Sky-Watcher USA offers three instruments in their line of ProED Doublet APO Refractors, with apertures of 3.2, 3.9, and 4.7 inches (80, 100, and 120 millimeters). "APO" stands for "apochromatic," which means the main optic has a high degree of color correction built in.

At the heart of all three scopes are two-element objective lenses of extra-low dispersion (ED) glass. Each front element is Schott BK-7, while the rear element is FPL-53, two of the most advanced types of glass available. And Sky-Watcher USA gives both state-of-the-art multicoatings. Together,

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they have the potential to minimize false color caused by chromatic aberration (a defect where colors don't focus at the same place) and maximize image contrast. But how do they perform in actual use?

The package arrives

To answer that question, I recently tested the flagship version — the ProED 120mm Doublet APO Refractor. The telescope arrived well packaged in double cardboard boxes and secured inside a custom-fit aluminum carrying case measuring 40 by 9 by 12 inches (102 by 23 by 30 centimeters). Together, they protected their delicate contents from any chance of damage during shipping.

When I opened the aluminum case, I saw the telescope nestled in a foam cradle, along with the standard accessories Sky-Watcher USA supplies with the instrument. These include an 8x50 right-angle, erect-image finder scope with mount; a 2" dielectric star diagonal with a 1¼" adapter; 5mm and 20mm 1¼" eyepieces; and a pair of tube



The ProED 120mm comes with a 2" star diagonal with a 1¼" adapter, 8x50 finder scope, and a two-speed Crayford-style focuser.

mounting rings attached to a 14-inch-long (36cm) dovetail mounting plate.

The 3-inch-wide (7.6cm) dovetail plate matches the standard used by both Losmandy and Celestron. It's the second most common size in use today, usually reserved for carrying heavy telescopes. For this test, however, I substituted my own Vixen-style bar, which is 1.75 inches (4.4cm) wide and the most common version. The ProED 120mm optical tube assembly weighs 11.3 pounds (5.1 kilograms) and measures 37.79 inches (96cm) long. My medium-duty German equatorial mount carried it easily.

Fit and finish

The aluminum telescope tube sports a beautiful finish of high-gloss black paint speckled with gold flakes. It gives the impression of stars floating in a crystal-clear sky. Both the (non-sliding) dew shield and focuser are eggshell white, as are the mounting rings and finder bracket.

Inside, the tube is well baffled and painted a uniform flat black to minimize any stray light entering the optical path and washing out the view.

Sky-Watcher USA configured the 8x50 right-angle finder scope to deliver an erect image, which makes star-hopping much easier. The finder's mount uses a spring-loaded piston combined with two thumb-screws for a quick and easy alignment.

My only complaint about the telescope concerns where the finder mount sits. Its slide-in base is cast into the focuser housing, which puts the finder's eyepiece close to the one on the telescope. With some eyepieces I tried, I found that my head hit one

Sky-Watcher USA packs the ProED 120mm into a foam-lined aluminum carrying case.

Sky-Watcher USA's ProED 120mm Doublet APO Refractor uses a 4.7-inch f/7.5 apochromatic doublet as its objective. The optical tube assembly comes with a dovetail mounting plate.

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eyepiece while trying to look through the other. If this were my own telescope, I would likely add a separate finder base onto the tube itself.

I'd make no change to the Crayford-style focuser, which offers both coarse and fine focusing. The left knob is for coarse adjustment only, while the right also includes a built-in 10:1 speed reducer for fine-tuning. You can lock the focuser in position with the twist of a thumbscrew threaded into the underside of the housing.

Looking at the other accessories, both the 2" star diagonal and 1¼" adapter use internal compression-style clamps to hold eyepieces securely while not marring their barrels' finish. This feature is a nice touch, and it speaks to the care the manufacturer took. Both the diagonal and the adapter also have internal threads to accept filters.

While many upper-end telescopes these days do not include eyepieces, the ProED

120mm includes two, a 20mm (that produces a magnification of 45x) and a 5mm (180x). Nothing on the 20mm eyepiece identifies its optical design, although judging by the apparent field of view, I suspect it is a Plössl. The 5mm carries the label "Sky-Watcher 1.25" – 5mm UWA 58°." The company calls them the LE20mm and the LE5mm, where "LE" stands for "long eye relief." Both performed well, and I also viewed through many of my own eyepieces.

Star light, star bright

I put the scope to the test against some of the targets in the midwinter sky. My first stop was the Moon. When viewed through most achromatic refractors, the lunar limb (edge) likely contains tinges of blue, purple, or yellow. An apochromatic refractor like the ProED 120mm should eliminate this false color entirely. And in practice, it did.

Shadows covering crater floors were appropriately pitch black rather than a milky gray. Craters and mountain ranges were all crisp and sharp. Very nice!

My next stop, Sirius, is a notoriously unforgiving object for chromatic aberration. I saw only minor evidence of false color through the supplied eyepieces.

I put the scope's relatively short focal length (900mm) to good use as I enjoyed wonderful views of the Orion Nebula (M42), the Pleiades (M45), and the Double Cluster in Perseus (NGC 869 and NGC 884). Ursa Major's dynamic galactic duo, Bode's Galaxy (M81) and the Cigar Galaxy (M82) — complete with the

latter's supernova — fit into the 20mm eyepiece's field of view.

Image contrast, so important to planet watchers, was also exceptional. Fine details in Jupiter's many belts, for instance, showed clearly. An oft-cited observing rule says not to exceed a magnification of 60x per inch of aperture. Yet on rare nights of steady seeing and given a high-quality eyepiece, the ProED 120mm easily handled 50 percent more magnification than the stated "limit."

Overall, Sky-Watcher USA's ProED 120mm Doublet APO Refractor is a solid performer. Apart from my minor comment about finder placement, this scope deserves high marks for optics, mechanics, and a great price point. ♪

PRODUCT INFORMATION

Sky-Watcher USA ProED 120mm Doublet APO Refractor

Optical design: Apochromatic refractor

Lens: Two elements, extra-low dispersion

Aperture: 4.7 inches (120 millimeters)

Focal length: 900 millimeters

Focal ratio: f/7.5

Weight: 11.3 pounds (5.1 kilograms)

Includes: Two-speed 2" Crayford-style focuser, 8x50 finder scope, 2" star diagonal with 1¼" adapter, 20mm (45x) and 5mm (180x) eyepieces, tube rings with dovetail mounting plate, foam-lined aluminum carrying case

Price: \$1,549

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The telescope's light-collector is a 4.7-inch f/7.5 apochromatic doublet lens with each element made of extra-low dispersion glass.

