

## ASTRO-PHYSICS

### 180 mm f9 STARFIRE EDT REFRACTOR (7.1" aperture)

The 180mm f9 StarFire EDT is a high performance instrument with a Super ED triplet objective that is highly corrected for false color (chromatic aberration). The chromatic aberration is less than 0.01% from 706 nm to 405 nm compared to a 2-element Fluorite apochromat with 0.05% and a Doublet Achromat with 0.46% over the same spectral range. In an age when Fluorite is being hyped as the best lens material for fast refractors, it is significant that Astro-Physics has developed a non-Fluorite objective with 5 times better chromatic aberration at a fraction of the cost of Fluorite. Super ED glass (ED stands for extra low dispersion,  $V_d > 90$ ) is a real glass, not a crystal like Fluorite. ED is a much harder, less fragile material with a lower expansion coefficient than Fluorite. Unlike Fluorite, ED glass is not affected by atmospheric contaminants and acids. It is for these reasons that the world's major camera makers are incorporating ED glass into their best lenses.

The extremely high color correction of the Super EDT design allows the construction of a relatively short-focus objective that is superior to long-focus achromats in contrast and definition of subtle planetary detail. The EDT lens is also perfectly matched to the characteristics of the fine-grained Technical Pan emulsions which have their peak sensitivity at 405nm. With our matching accessories, you can create impressive astrophotos on 35mm and 6 x 7cm film formats.

The optical design of the 180mm EDT objective consists of a positive element of ED glass surrounded by two matching hard crown meniscus lenses. The two outer elements are chosen so that the combination is free of coma, spherical aberration and other higher-order aberrations. All surfaces are spherical, which results in a very smooth overall figure. Under steady viewing conditions, you will see a hard white Airy disc at focus surrounded by the first diffraction ring. Inside and outside of focus you will see an evenly illuminated, expanded disc with concentric Fresnel rings, the outermost ring brighter and wider than the rest. The two air-glass surfaces have multi-layer anti-reflection coatings that result in overall light transmission greater than 97% in peak visual wavelengths.

#### MECHANICAL CONSTRUCTION

We have incorporated several significant improvements to the tube assembly to make it easier to transport and set up in the field. The dewcap slides over the lens cell for more compact storage. An aluminum dust cover protects the optical surface when not in use, and a foam-fitted carrying case will help retain the beauty of your tube assembly for years. The tube is fully baffled and painted with light-absorbing flat black, and it features our adjustable push-pull cell.

Our superb Astro-Physics focuser is a very finely crafted unit with several unique features. The components are machined on our own CNC to extremely high tolerances assuring that there is no wiggle between the drawtube and housing. More than a dozen knife-edge baffles are machined into the wall of the drawtube and painted flat black in order to maximize contrast by essentially eliminating any internal reflections. The inside diameter (I.D.) of the drawtube is 2.7" which allows the avid astrophotographer to use a medium-format camera to capture images in a 6 x 7cm format with minimal vignetting. You can use standard accessories with the 2" and 1.25" adapters. Recessed brass locking rings are installed at each thumbscrew location. As you tighten each thumbscrew, the brass locking ring clamps onto the part that has been inserted. Consequently, your focuser drawtube and 2" and 1.25" accessories are held securely in place. This is particularly important considering the heavy and expensive accessories that you may use. As an added advantage, the brass will not mar the surface of your accessories.



180mm StarFire EDT, 1200 German Equatorial, 48" Pier and accessories

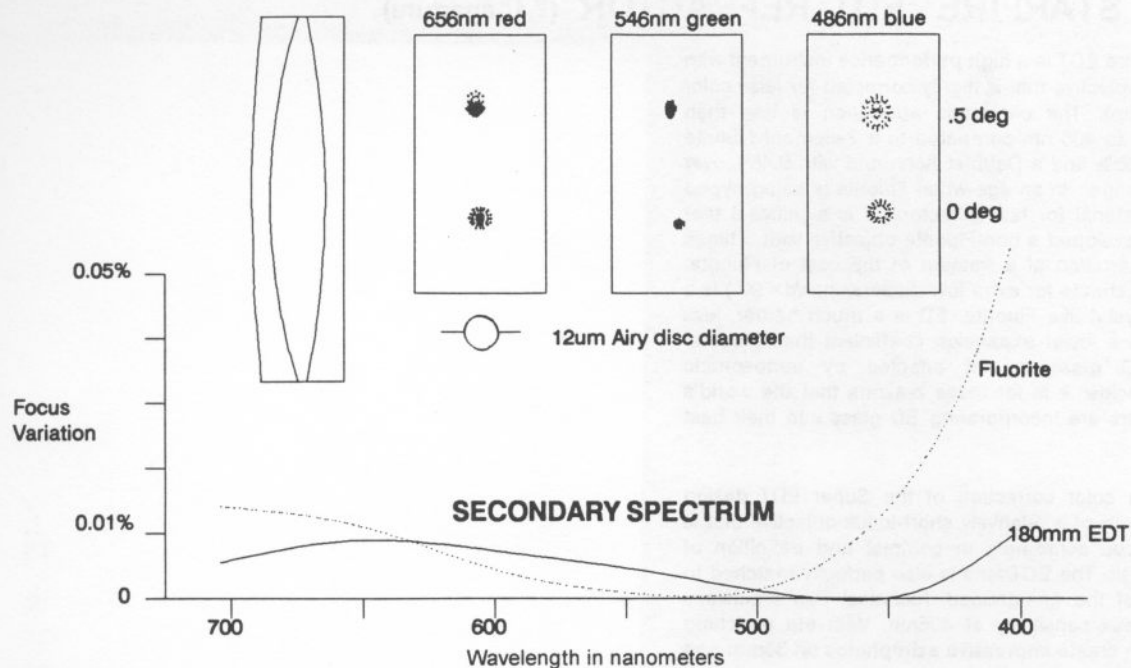
#### PERFORMANCE

The 180mm StarFire EDT was developed with our model 800 German Equatorial Mount to be the largest refractor system that is reasonably portable. It has 36% more light grasp than a 6" refractor and twice the light grasp of a 5" refractor. The planetary performance of the 180 StarFire is breathtaking, to say the least. At opposition, Mars reveals so much detail that it is difficult to draw everything that is visible. Deep-sky views are bright and contrasty. The high-definition optics reveal mottling and detail in nebulae where ordinary telescopes show only fuzzy outlines.

Stunning photographs of M33 reveal spiral arms as sprinklings of fine powdered sugar. H-alpha photographs of the sun's surface taken at full aperture rival anything we have seen from the professional observatories.

The views through your 180 StarFire EDT will draw crowds at star parties. Plan on standing in line to observe through your own scope! You will be very pleased with the mechanical construction of this beautiful refractor, and the way it performs optically will delight you.

## 180mm F9 STARFIRE EDT SPOT DIAGRAMS FOR VISUAL WAVELENGTHS, .5 DEG FIELD



### SPECIFICATIONS

Color correction:	Less than 0.01% focus variation from 706nm to 405nm.
Clear aperture:	180mm (7.1")
Focal length:	1620mm (64")
Resolution:	0.64 arc seconds
Coatings:	Multi-layer, overall transmission greater than 97% in peak visual wavelengths
Magnification range:	30x to 700x
Tube assembly:	White, 8.0" aluminum tube, baffled; flat black interior; engraved retaining ring; push-pull lens cell
Focuser type:	2.7" I.D. Astro-Physics rack & pinion focuser, 4.5" travel; 2" and 1.25" adapters; 2.5" extension
Telescope length:	1524mm (60") with dewcap fully retracted

Weight with dewcap:	35 lbs. (15.9 kg)
Carrying case type:	Wood case with grey vinyl covering and foam-lined interior

Case outside dimensions:	64" x 12" x 12" (173cm x 30cm x 30cm)
Weight of empty case:	32 lbs (14.5 kg)

35mm prime-focus field:	0.9 x 1.2 degrees @ f9
35mm telecompressor field:	1.1 x 1.6 degrees @ f6.7
35mm field with 2x Barlow:	0.4 x 0.6 degrees @ f18
6 x 7cm prime-focus field:	2.1 x 2.5 degrees @ f9

Specifications subject to change without notice.

### FEATURES OF THE OPTICS

- Very high corrections of spherical and chromatic aberrations
- Visual and photographic focus is identical, eliminating the need for light-absorbing filters
- Clear, colorfree glass types result in brighter, more contrasty images
- Stunning lunar/planetary and deep-sky views
- Ideal for 35mm and medium-format deep-sky astrophotography
- High-resolution optics are a great match for fine-grained Technical Pan emulsions.

### FEATURES OF THE TUBE ASSEMBLY

- Felt-lined dewcap slides over cell for storage
- Fully baffled tube and focuser assures highest contrast
- Giant 2.7" focuser allows coverage of 6 x 7cm formats
- 2" and 1.25" adapters with brass locking ring, 2.5" extension
- Beautifully machined parts, expertly finished in hard polyurethane paint or black anodized
- Aluminum lens cover to protect against dust
- Sturdy foam-padded carrying case

### SUGGESTIONS

#### Mounting:

- 800 German Equatorial Mount with Dual Axis Drive
- 900 German Equatorial Mount with Dual Axis Drive
- 1200 German Equatorial Mount with Dual Axis Drive
- 54" Portable Pier to match above mounts

#### Eyepieces:

Plossls, Orthoscopics, and Widefield eyepieces show sharp images only in the center of the field. These are fine as long as you realize this limitation. If you object to astigmatic images at the edge of the field, we recommend TeleVue Nagler and Panoptic eyepieces. These oculars have the best flat field images and will bring out the most in your 180 StarFire EDT. Use our 2" (2x) Barlow to double your magnification.

	magnification	actual field of view	exit pupil
55mm Plossl	29x	1.7 deg	6.2mm
35mm Panoptic	46x	1.5 deg	3.9mm
22mm Panoptic	74x	0.9 deg	2.4mm
13mm Nagler	125x	0.7 deg	1.4mm
9mm Nagler	180x	0.5 deg	1.0mm
7mm Nagler	231x	0.4 deg	0.8mm
4.8mm Nagler	338x	0.3 deg	0.5mm

Please refer to the brochure for descriptions of these items and additional accessories.