

FCT-114D

A New Standard in Compact High-Performance Fluorite Refractors

The **FCT-114D** is a lightweight, ultra-compact triplet fluorite refractor that delivers premium optical performance in an exceptionally portable form factor.

Its advanced three-element objective features a fluorite element precisely positioned between two crown glass elements, providing outstanding color correction and contrast.

With an effective aperture of **114 mm (4.5 inches)** and a focal length of **800 mm (F/7)**, the FCT-114D combines the power of a large-aperture refractor with the convenience of a compact design.

Through optimized color-corrected spherical aberration control, the telescope achieves excellent suppression of blue halo while delivering a remarkably high **visual Strehl ratio of 97.5%**, approaching the performance of the renowned TOA series.

Unlike fully air-spaced triplet designs, the closely coupled triplet configuration enables a simpler and more compact lens cell.

This innovative structure allows the optical tube diameter to be reduced to **just 114 mm**, matching the effective aperture — an achievement that results in exceptional portability without compromising performance.

The result is a telescope that is **powerful, compact, and easy to handle**, offering superb versatility for both visual observation and astrophotography.

Whether used in the field or at the observatory, the FCT-114D delivers performance that exceeds expectations for its size.

Two Configurations to Match Your Needs

The **FCT-114DF** is designed with serious astrophotographers in mind.

It features a wide-aperture focuser with a precision reduction micro-adjustment mechanism, similar to that used in the FSQ-85ED, minimizing vignetting and maximizing imaging performance across large sensors.

The **FCT-114DS**, on the other hand, is optimized for visual observers.

It offers a lighter and more accessible configuration while still maintaining excellent

optical performance.

When used with a reducer or flattener, slight vignetting may occur near the edges of a full-frame sensor, but overall image quality remains outstanding.

Purpose-Built Imaging Accessories

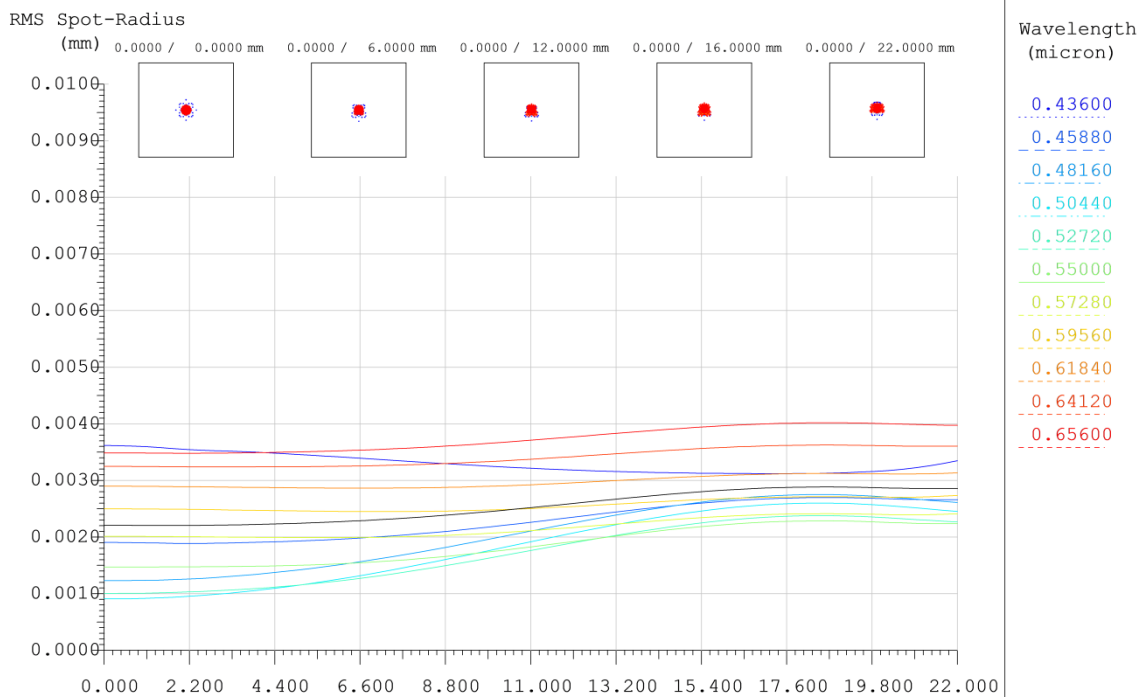
Newly designed specifically for the FCT-114D, the **L Flattener 0.99 × (under development)** and **L Reducer 0.8 × (under development)** deliver exceptional image quality with extremely low peripheral light falloff.

When paired with the **FCT-114DF**, the **L Flattener 0.99 × (under development)** produces a focal length of **795 mm (F/7)** and delivers a flat, evenly illuminated field across a full-frame sensor.

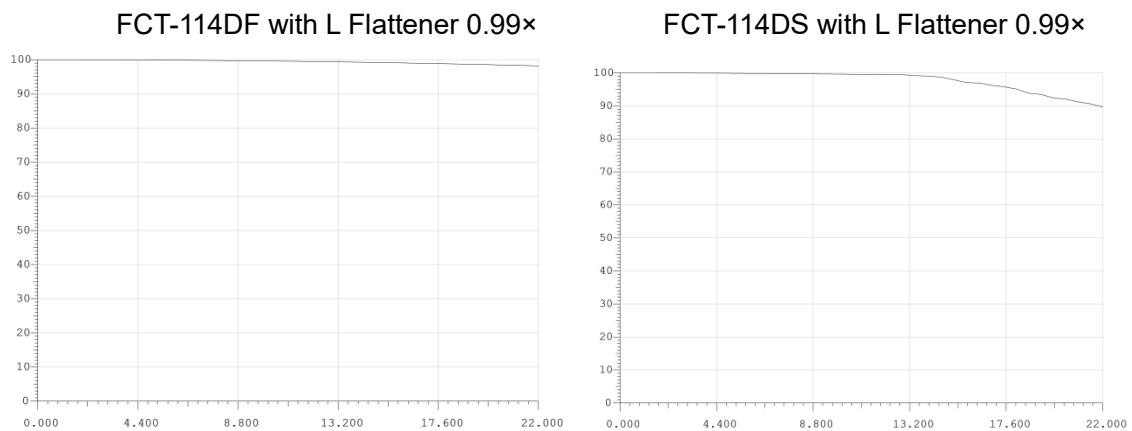
With the **L Reducer 0.8 × (under development)**, the focal length is reduced to **639 mm (F/5.6)**, enabling faster imaging while maintaining excellent illumination — approximately **90% at the extreme corners** of a full-frame format.

FCT-114D with L Flattener 0.99 ×
Focal Length: 795 mm | F/7

RMS Spot Radius and 100-Micron Box Spot Diagram



Illumination Distribution



The **L Flattener 0.99x** is a newly designed two-element, two-group optical corrector developed specifically for the **FCT-114D**.

The RMS spot diameter, optimized across the entire visible wavelength range, measures **4.5 microns at the center** and **6 microns at the edge of a full-frame sensor**.

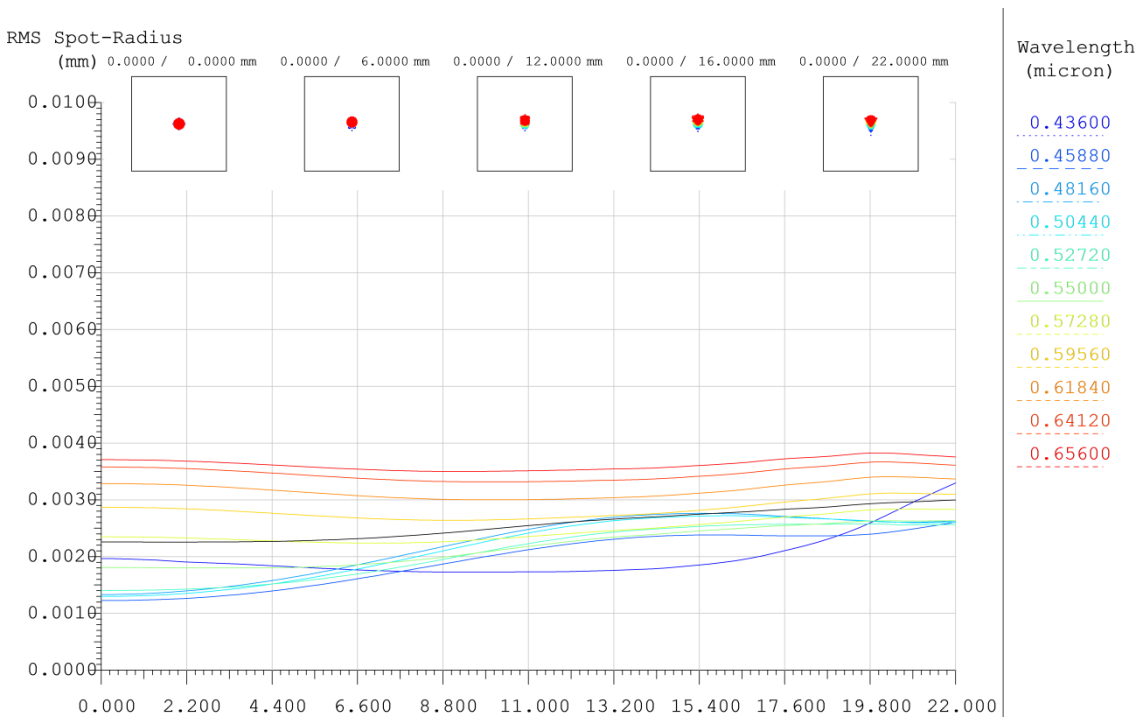
When used with the **FCT-114DF**, the system delivers **virtually 100% illumination** across the full-frame field.

Even when paired with the **FCT-114DS**, it maintains **approximately 90% or greater illumination** at the edge of a full-frame sensor.

As a result, the system produces a **flat-field image with minimal star distortion** across the entire full-frame format at a focal length of **795 mm (F/7)**.

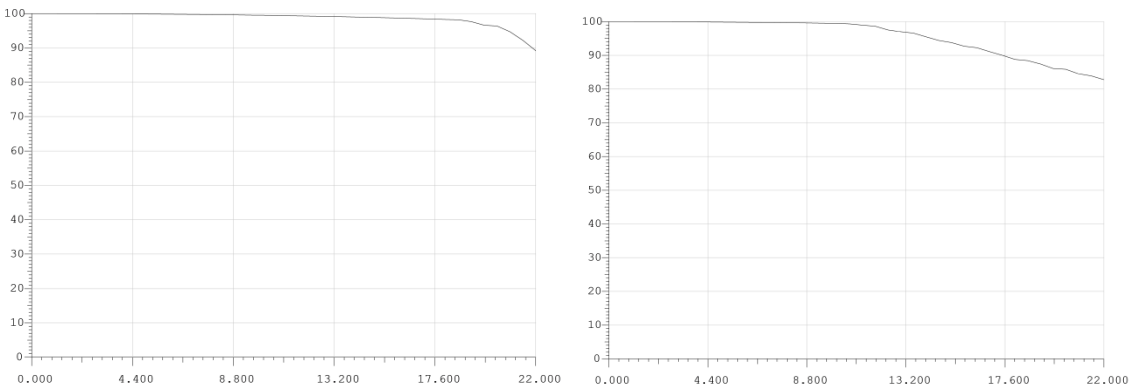
FCT-114D with L Reducer 0.8 ×
Focal Length: 639 mm | F/5.6

RMS Spot Radius and 100 μm Box



FCT-114DF with L Reducer 0.8 ×

FCT-114DS with L Reducer 0.8 ×



The **L Reducer 0.8 ×** is a newly designed three-element, two-group optical corrector developed specifically for the **FCT-114D**.

The RMS spot diameter, optimized across the entire visible wavelength range, measures **4.5 microns at the center** and **6 microns at the edge of a full-frame sensor**.

When used with the **FCT-114DF**, illumination remains **virtually 100% out to a 35 mm image circle**, decreasing slightly to approximately **90% at the extreme corners of a full-frame sensor**.

When paired with the **FCT-114DS**, vignetting begins around a **20 mm image circle**, yet the system still maintains **greater than 83% illumination** at the corners of a full-frame sensor.

In both configurations, the system functions as a high-performance astrograph with a focal length of **640 mm (F/5.6)**, delivering excellent imaging capability across the full-frame format.

FCT-114DF Spec

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Optical Design:

Three-element, three-group fluorite apochromat

Optical Tube:

FCT-114DF

Tube Outside Diameter:

114 mm (145 mm dew shield diameter)

Effective Aperture:

114 mm

Tube Length:

795–884 mm

Focal Length:

800 mm

Focal Ratio:

f/7

Finder Scope:

Optional

Weight:

Approx. 5.5 kg

Other Features:

Built-in focus reduction micro-adjustment mechanism (right-side mounted)

FCT-114DS Optical Tube Assembly — Specifications

Optical Design:

Three-element, three-group fluorite apochromat

Optical Tube:

FCT-114DS

Tube Outside Diameter:

114 mm (145 mm dew shield diameter)

Effective Aperture:

114 mm

Tube Length:

795–884 mm

Focal Length:

800 mm

Focal Ratio:

f/7

Finder Scope:

Optional

Weight:

Approx. 5.1 kg

FCT-L Flattener 0.99 × — Specifications

Optical Design:

Two elements in two groups

Effective Focal Length:

795 mm f/7

Image Circle:

55 mm diameter (82% illumination)

FCT-L Reducer 0.8 × — Specifications

Optical Design:

Three elements in two groups

Effective Focal Length:

639 mm f/5.6

Image Circle:

44 mm diameter