TECHSPEC® SWIR FIXED FOCAL LENGTH IMAGING LENSES #83-167 • 50mm FL • f/2.15

TECHSPEC® SWIR Fixed Focal Length Imaging Lenses are compact, lightweight SWIR lenses designed for applications operating in the short-wave infrared spectra, which ranges from 0.9 – 1.7µm. SWIR lenses are ideal for a range of applications including inspection, sorting, or quality control. These SWIR lenses are anti-reflection coated from 0.8 – 1.8µm, in addition to being designed to cover large, 25mm sensors. TECHSPEC® SWIR Fixed Focal Length Imaging Lenses are commercial off-the-shelf (COTS) lenses with low f/#'s for high throughput and improved performance.

Focal Length:	50mm
Minimum Working Distance[1]:	275mm
Focus Range[1] (lockable):	275mm – ∞
Length at Near Focus:	126.3mm
Length at Far Focus:	116.8mm
Max. Rear Protrusion:	0mm
Filter Thread:	M43 x 0.75
Camera Mount:	M42 x 1.0

Aperture (f/#):	f/2.15 - f/16, lockable
Magnification Range:	0X - 0.18X
Distortion[2]:	<1.0%
Numerical Aperture[2]:	0.037
Image Circle:	25.6mm
No. of Elements (Groups):	10 (6)
AR Coating:	0.8-1.8µm BBAR
Weight:	572g

Sensor Size (Diagonal)	10.2mm*	12.3mm*	16.0mm†	20.5mm*	20.5mm††	25.6mm††
Field of View[3]	45.1mm - 9.2°	54.4mm - 11.0°	72.5mm - 14.6°	90.6mm - 18.2°	116.1mm - 23.1°	145.0mm - 28.7°

1. From front of housing 2. At Min Working Distance 3. Horizontal FOV *5:4 aspect ratio †4:3 aspect ratio ††Linear Sensor

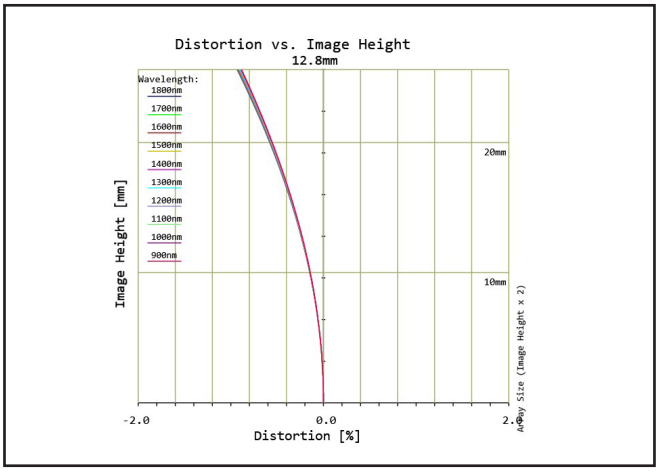

Figure 1: Distortion at the maximum sensor format. Postive values correspond to pincushion distortion, negative values correspond to barrel distortion.

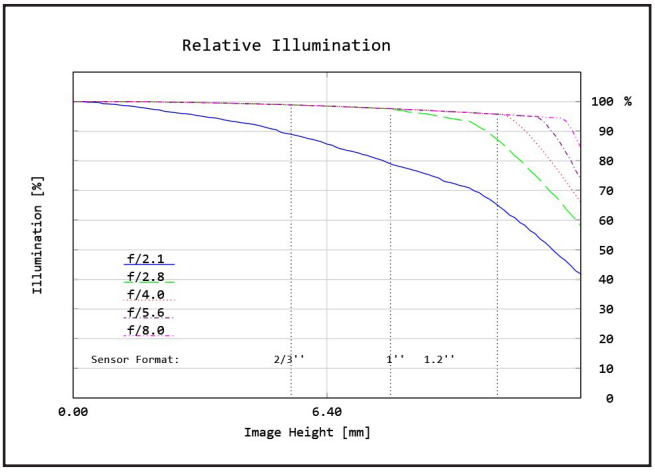

Figure 2: Relative illumination (center to corner)

In both plots, field points corresponding to the image circle of common sensor formats are included. Plots represent theoretical values from lens design software. Actual lens performance varies due to manufacturing tolerances.

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MTF & DOF: f/2.8
WD: 750mm

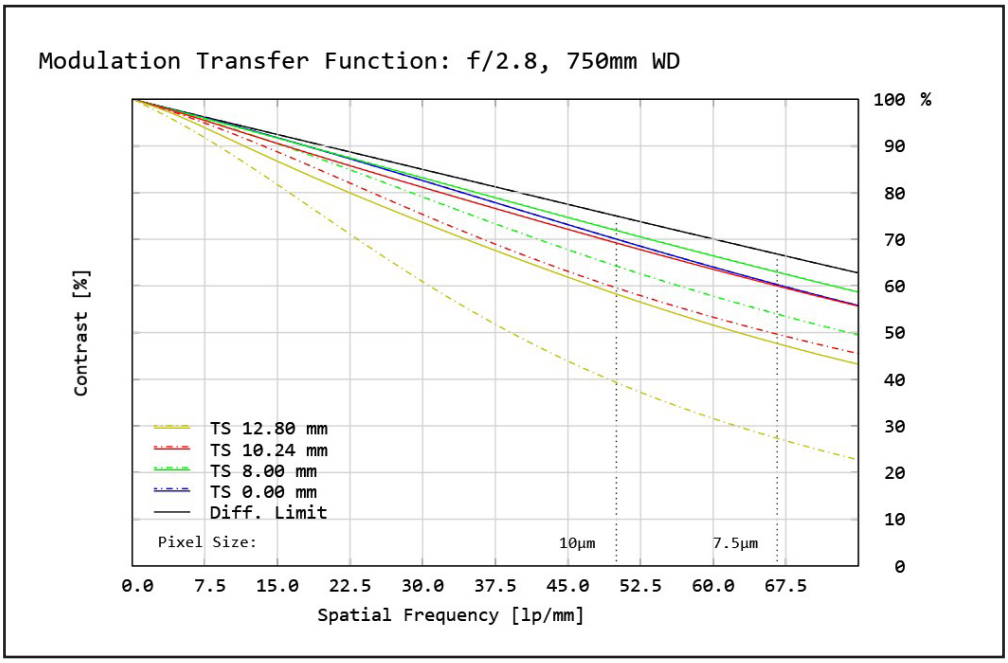

Figure 3: Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for λ = 0.8µm - 1.8µm. Included are Tangential and Sagittal values for field points on center, at 70% of full field and at the maximum sensor format. Solid black line indicates diffraction limit determined by f/#-defined aperture. Frequencies corresponding to the Nyquist resolution limit of pixel sizes are indicated.

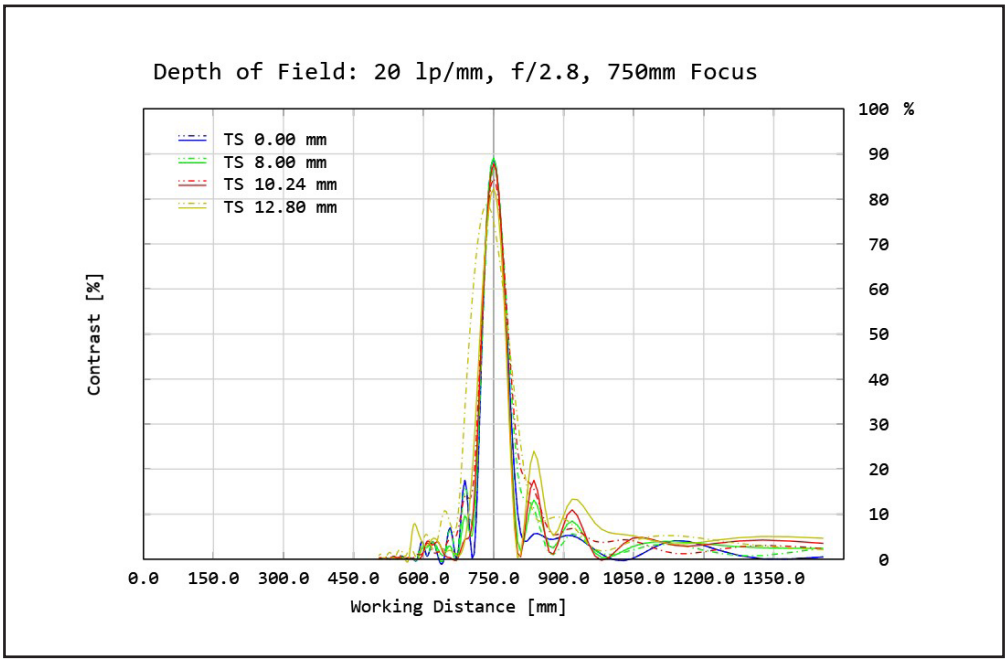

Figure 4: Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

Plots represent theoretical values from lens design software. Actual lens performance varies due to manufacturing tolerances.