

TECHSPEC® COMPACT INSTRUMENTATION IMAGING LENS

#86-609 • 12mm FL • f/4

Featuring low lens-to-lens variation and a broadband anti-reflection (AR) coating for maximum light transmission, TECHSPEC® Compact Instrumentation Imaging Lenses are ideal for a wide range of applications. An adjustable, lockable focus enables setting the best focus position prior to integrating into instrumentation, avoiding future adjustments. The wide range of fixed aperture options ensures maximum flexibility of resolution, throughput, and depth of field. These compact lenses are designed specifically for volume integration into applications such as analytical medical devices, including benchtop-based blood analyzers. For customized f/# versions to best suit your instrumentation application needs and to discuss volume requirements, please contact us.

Focal Length:	12mm
Minimum Working Distance¹:	200mm
Focus Range¹:	200mm - ∞
Length at Near Focus:	26.1mm
Length at Far Focus:	24.9mm
Filter Thread:	M22 x 0.75
Max Sensor Format:	2/3"
Camera Mount:	C-mount



Aperture (f/#):	f/4, Fixed
Magnification Range:	0X - 0.055X
Distortion²:	<2.5%
Object Space NA²:	0.0047
No. of Elements (Groups):	7 (7)
AR Coating:	425-675nm BBAR
Weight:	31g

Sensor Size	1/4"	1/3"	1/2.5"	1/2"	1/1.8"	2/3"	1"	4/3"
Field of View ³	64.4mm - 17.2°	85.9mm - 22.9°	102.4mm - 27.0°	115mm - 30.3°	130mm - 33.5°	159.4mm - 41.1°	NA	NA

1. From front of housing 2. Fig 1 Distance: 300mm 3. Horizontal FOV on standard 4:3 sensor format

Specifications subject to change

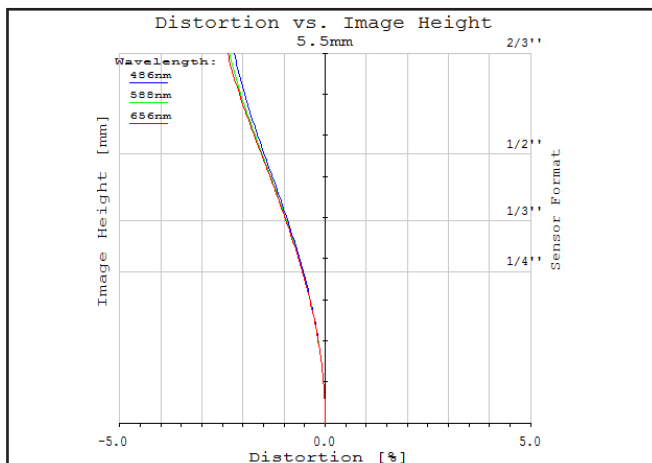


Figure 1: Distortion at the maximum sensor format. Positive values correspond to pincushion distortion, negative values correspond to barrel distortion.

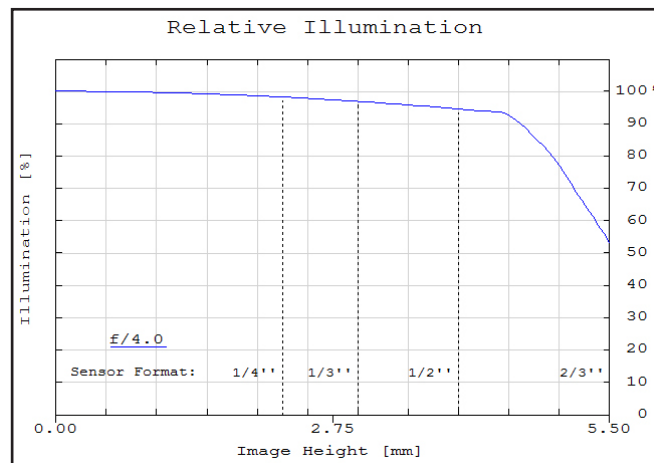


Figure 2: Relative illumination (center to corner)

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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#86-609 • 12mm FL • f/4

MTF & DOF: f/4
WD: 300mm

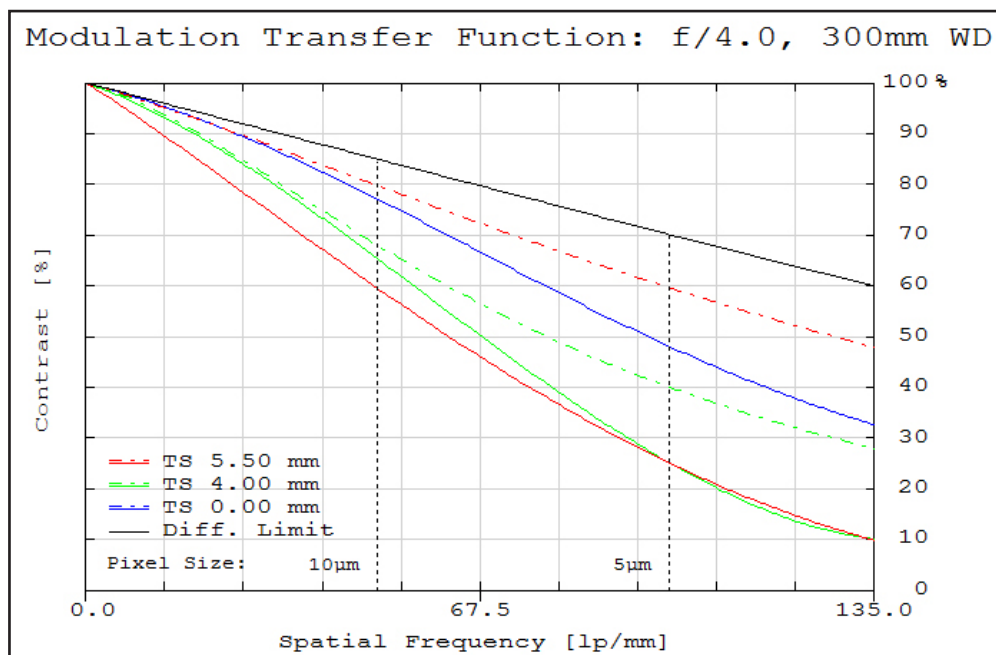


Figure 3: Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for $\lambda = 486\text{nm}$ to 656nm . Included are Tangential and Sagittal values for field points on center, at 70% of full field and at the maximum sensor format. Solid black line indicates diffraction limit determined by $f/\#$ -defined aperture. Frequencies corresponding to the Nyquist resolution limit of pixel sizes are indicated.

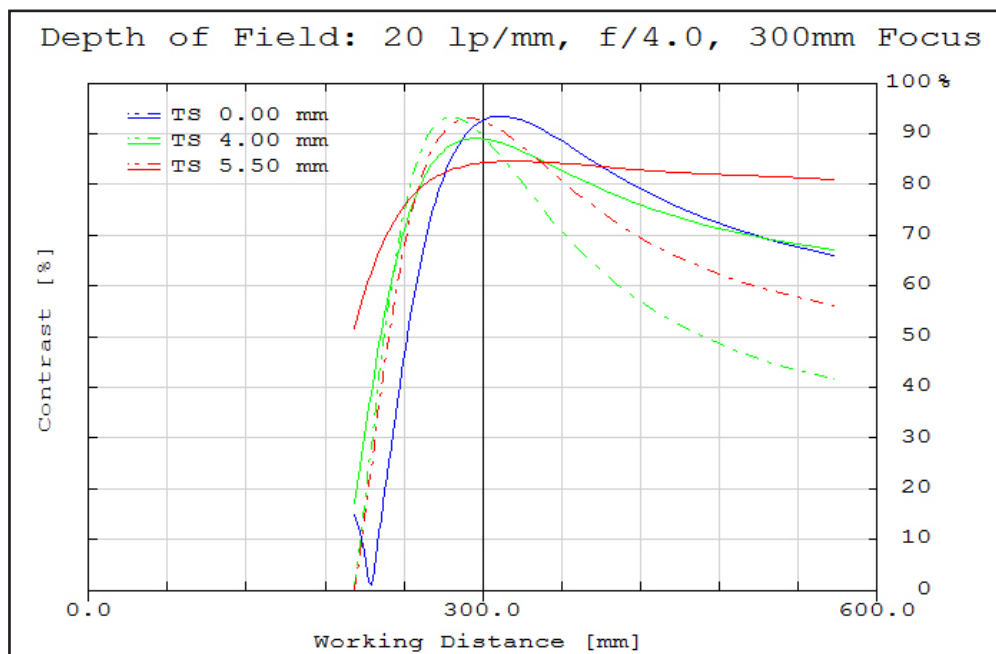


Figure 4: Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

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

TECHSPEC® COMPACT INSTRUMENTATION IMAGING LENS

#86-609 • 12mm FL • f/4

MTF & DOF: f/4
WD: 750mm

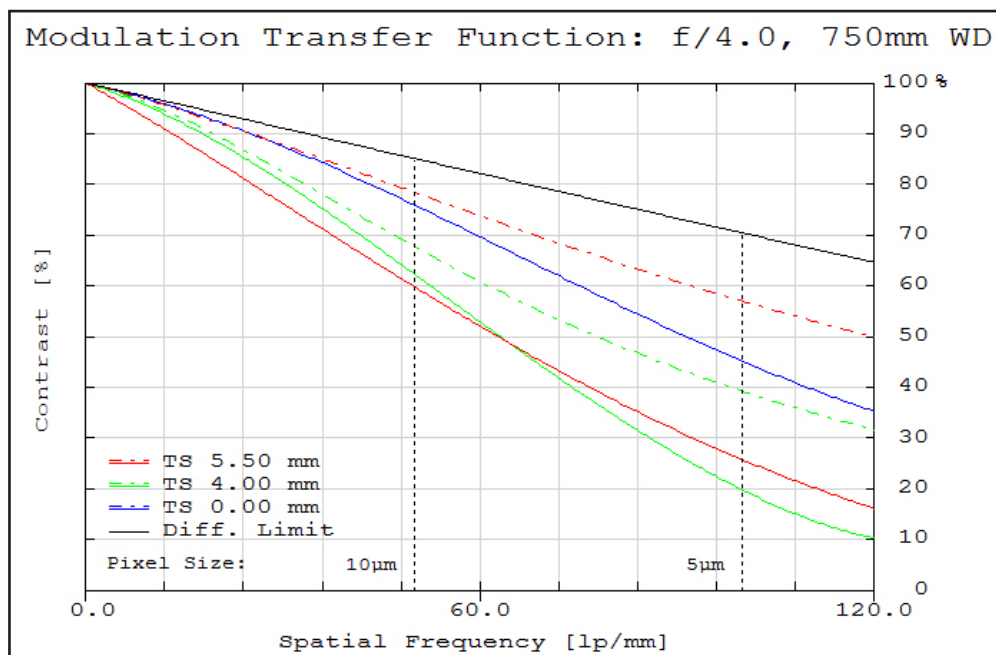


Figure 5: Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for $\lambda = 486\text{nm}$ to 656nm . Included are Tangential and Sagittal values for field points on center, at 70% of full field and at the maximum sensor format. Solid black line indicates diffraction limit determined by $f/\#$ -defined aperture. Frequencies corresponding to the Nyquist resolution limit of pixel sizes are indicated.

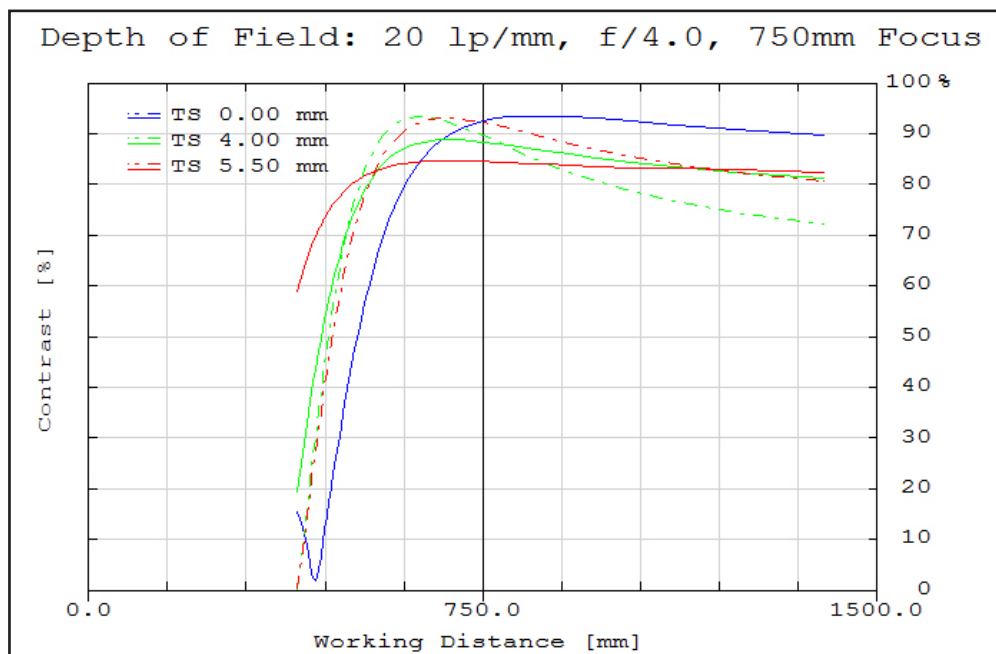


Figure 6: Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

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