

# TECHSPEC® COMPACT FIXED FOCAL LENGTH LENS

#59-873 • 50MM FL • F2.0

Designed for use in machine vision applications, our TECHSPEC® Compact Fixed Focal Length Lenses are ideal for use in factory automation, inspection or qualification. These machine vision lenses have been optically designed with the working distance and resolution requirements of factory automation and inspection in mind. Featuring large maximum apertures, these high performance lenses can be used in even the most restrictive lighting conditions. Each lens has a broadband anti-reflection coating, which increases transmission by up to 12 percent over the standard MgF2 coating on competitive lenses.

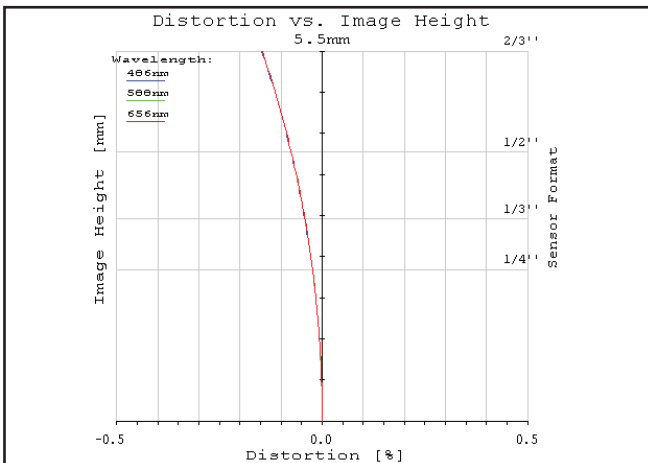


<b>Focal Length:</b>	50mm
<b>Minimum Working Distance<sup>1</sup>:</b>	250mm
<b>Focus Range<sup>1</sup> (Lockable):</b>	250mm - ∞
<b>Length at Near Focus:</b>	56.2mm
<b>Length at Far Focus:</b>	49.9mm
<b>Filter Thread:</b>	M25.5 x 0.5
<b>Max. Sensor Format:</b>	2/3"
<b>Camera Mount:</b>	C-Mount

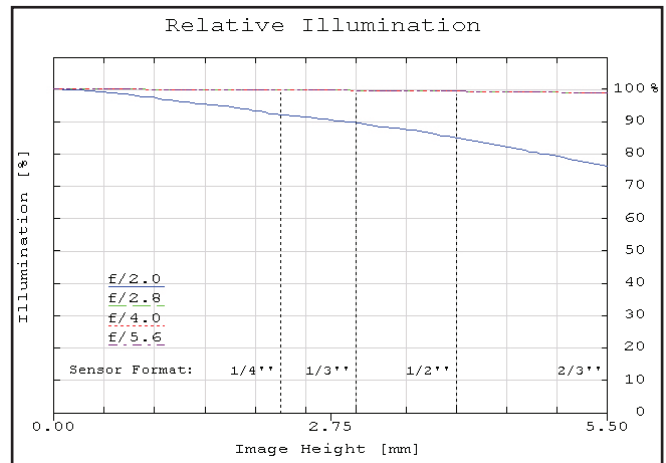
<b>Aperture (f/#):</b>	f2 - f22
<b>Magnification Range:</b>	0X - 0.21X
<b>Distortion<sup>2</sup>:</b>	<0.2%
<b>Object Space NA<sup>2</sup>:</b>	0.018
<b>Number of Elements (Groups):</b>	6 (4)
<b>AR Coating:</b>	425 - 675nm BBAR
<b>Weight:</b>	106g

Sensor Size	1/4"	1/3"	1/2.5"	1/2"	1/1.8"	2/3"	1"	4/3"
<b>Field of View<sup>3</sup></b>	17.2mm - 3.5°	23.0mm - 4.6°	27.6mm - 5.5°	31.0mm - 6.2°	34.7mm - 6.9°	42.5mm - 8.5°	N/A	N/A

1. From front of housing 2. At 500mm W.D. 3. Horizontal FOV on standard 4:3 sensor format. Min. W.D. - angular FOV at infinite conjugate Specifications subject to change



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



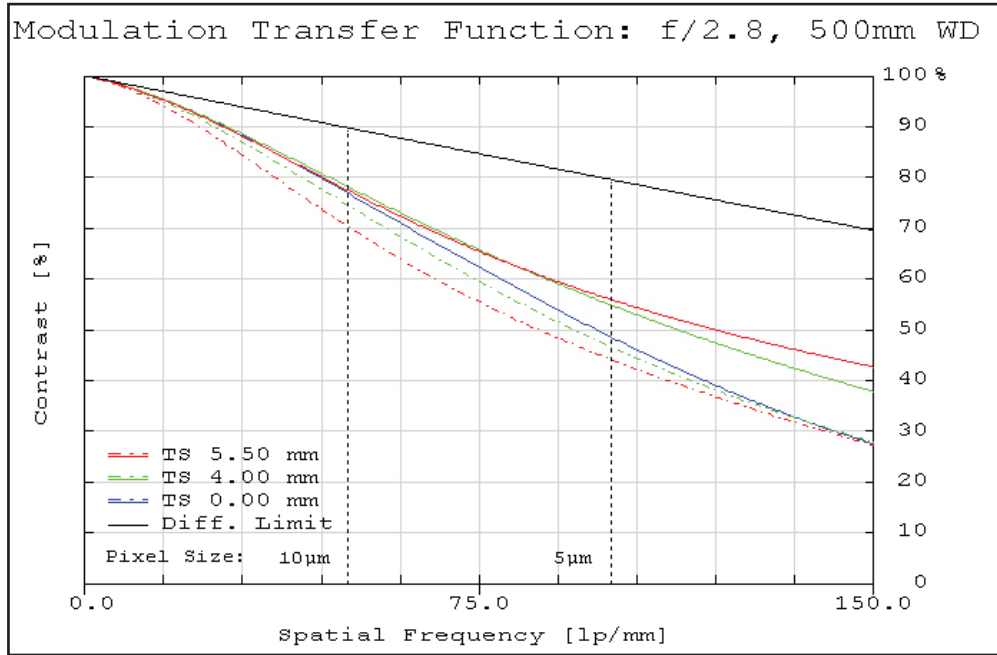
**Figure 2:** Relative illumination (center to corner)

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.

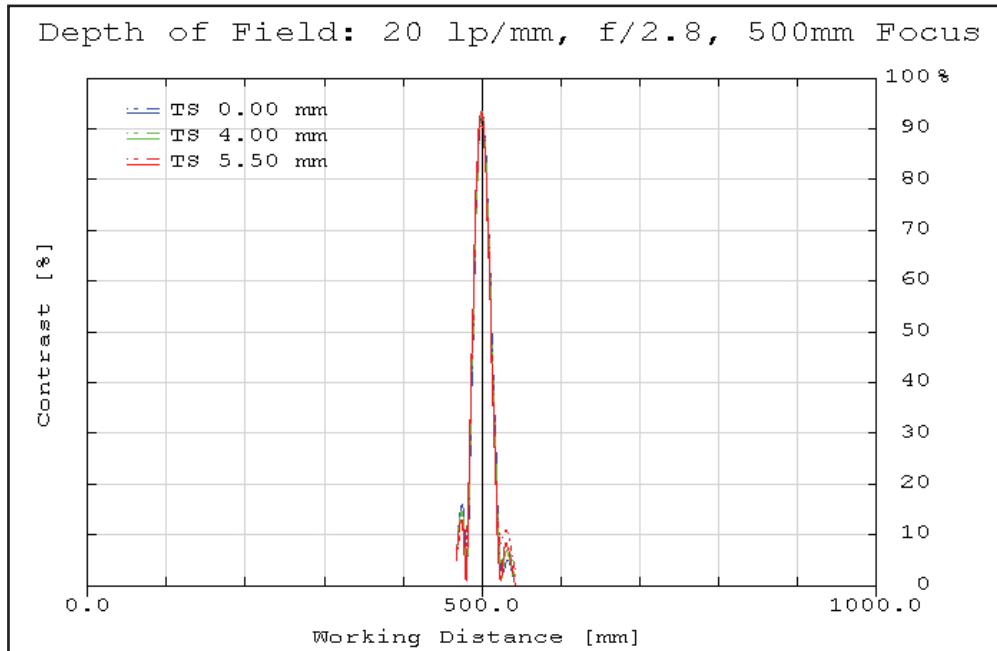
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#59-873 • 50MM FL • F2.0

MTF & DOF: F2.8  
WD: 500MM



**Figure 3:** Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for  $\lambda = 486\text{nm}$  to  $656\text{nm}$ . 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.



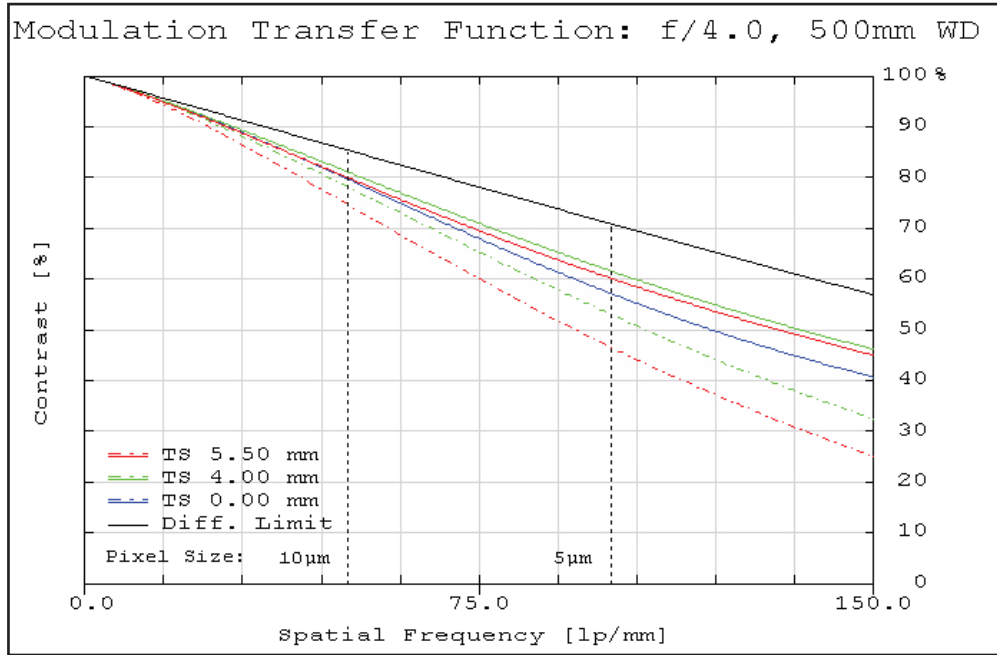
**Figure 4:** Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

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

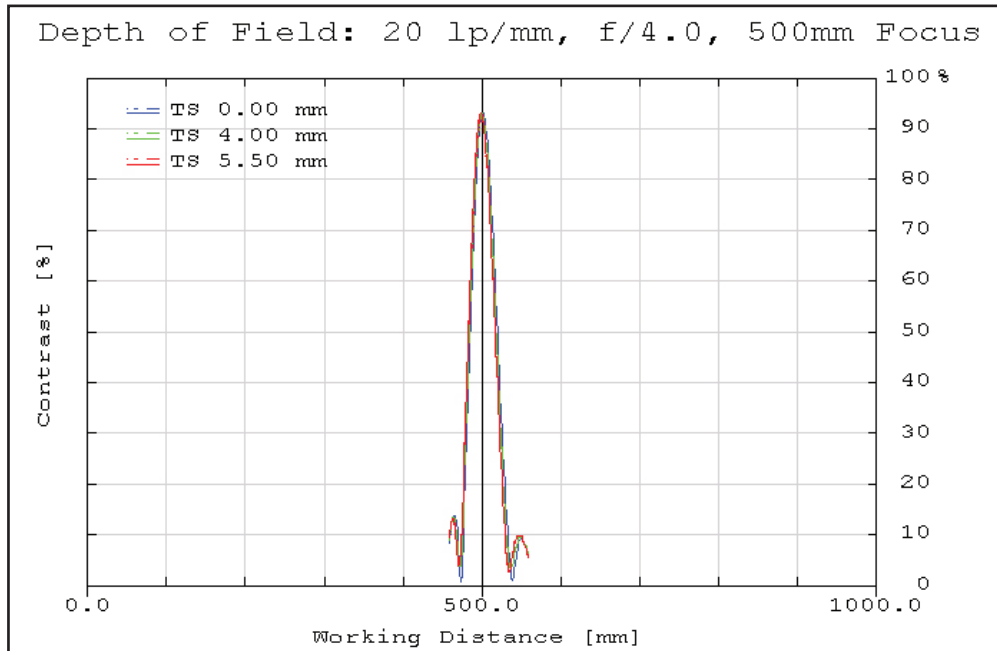
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#59-873 • 50MM FL • F2.0

MTF & DOF: F4.0  
WD: 500MM



**Figure 5:** Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for  $\lambda = 486\text{nm}$  to  $656\text{nm}$ . 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.

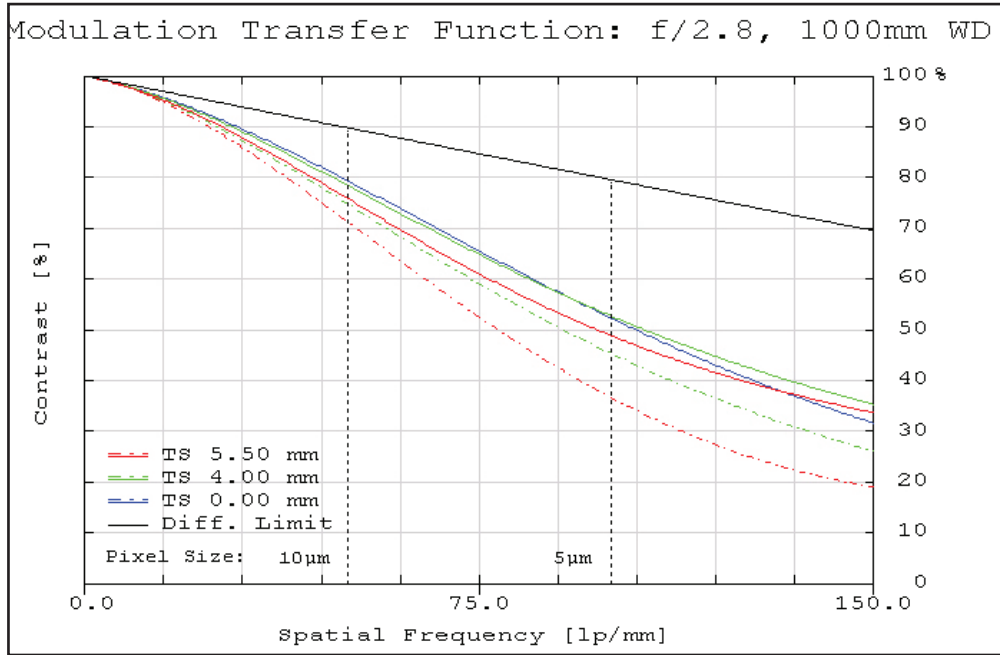


**Figure 6:** Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

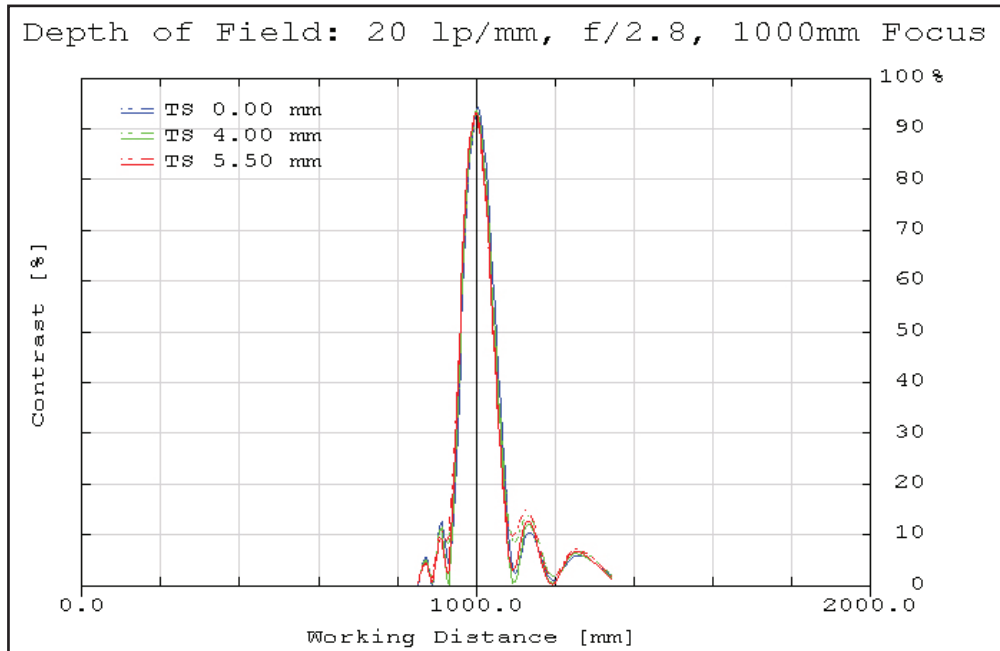
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MTF & DOF: F2.8  
WD: 1000MM



**Figure 7:** Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for  $\lambda = 486\text{nm}$  to  $656\text{nm}$ . 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.



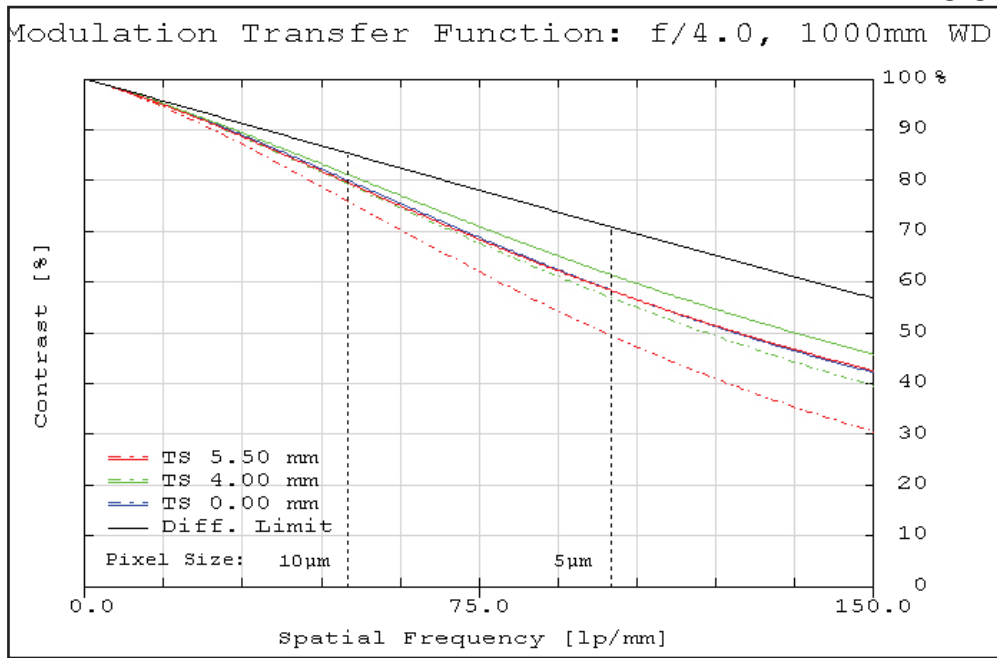
**Figure 8:** Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

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

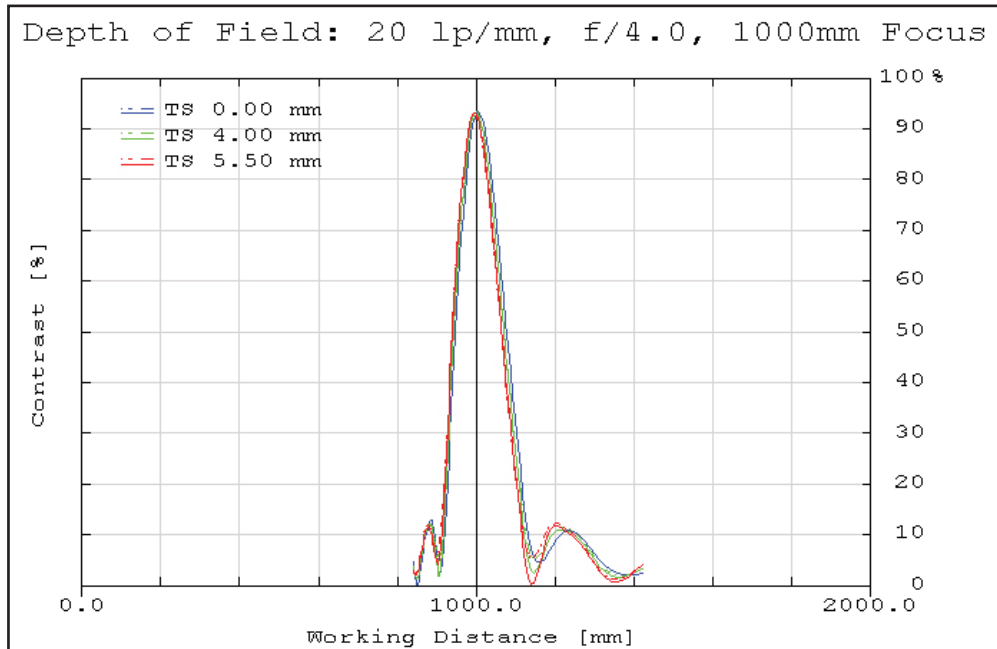
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#59-873 • 50MM FL • F2.0

MTF & DOF: F4.0  
WD: 1000MM

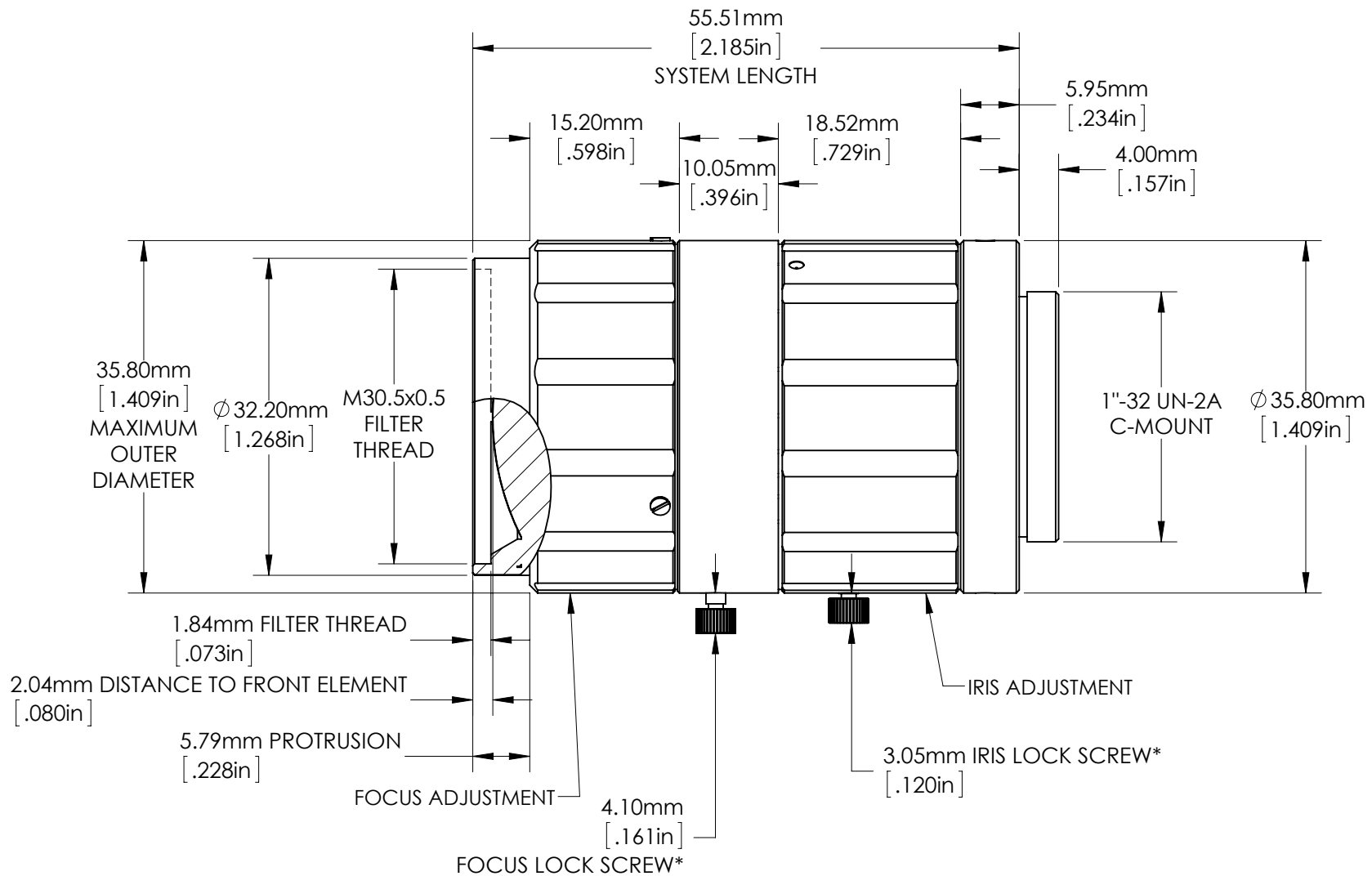


**Figure 9:** Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for  $\lambda = 486\text{nm}$  to  $656\text{nm}$ . Included are Tangential and Sagittal values for field points on center, at 70% of full field and at the maximum sensor format. Solid black line indicates diffraction limit determined by  $f/\#$ -defined aperture. Frequencies corresponding to the Nyquist resolution limit of pixel sizes are indicated.



**Figure 10:** 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.



VIEW OF LENS FOCUSED TO INFINITY WORKING DISTANCE

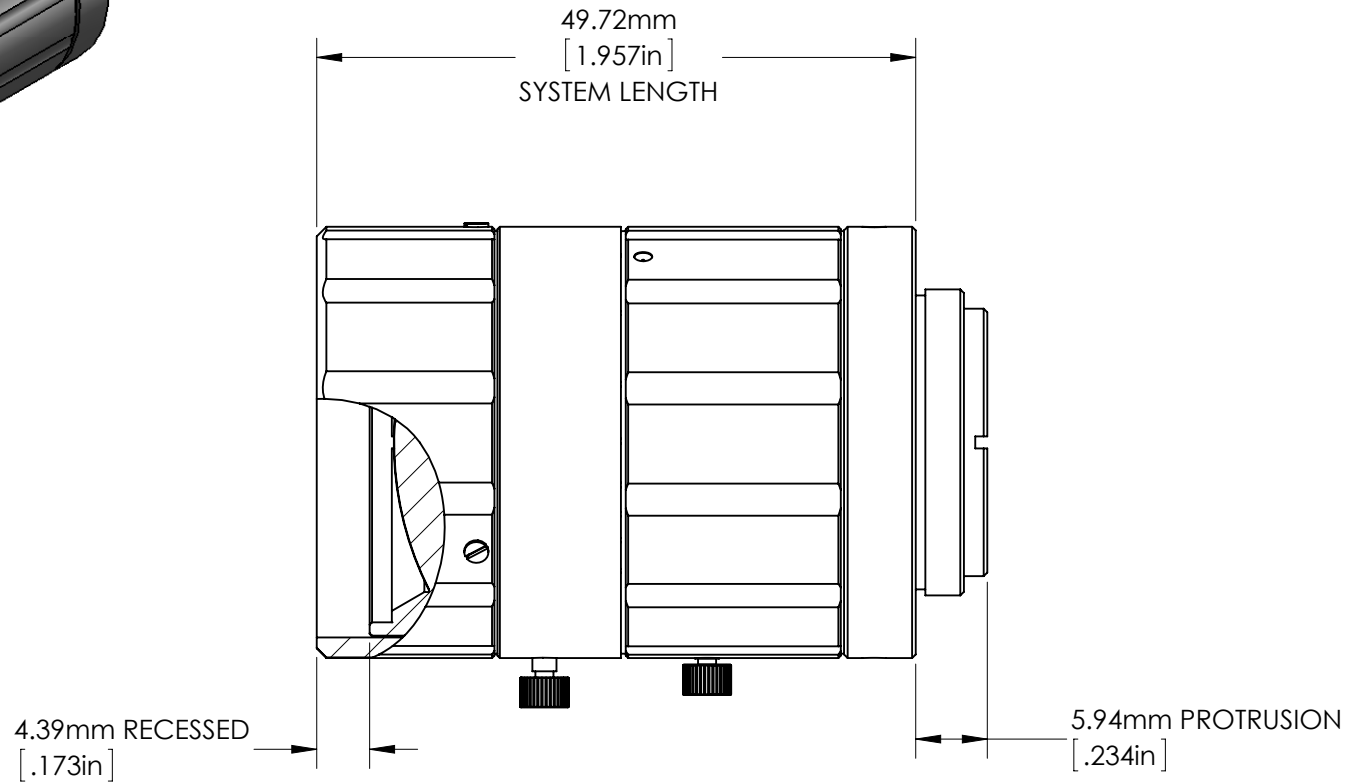
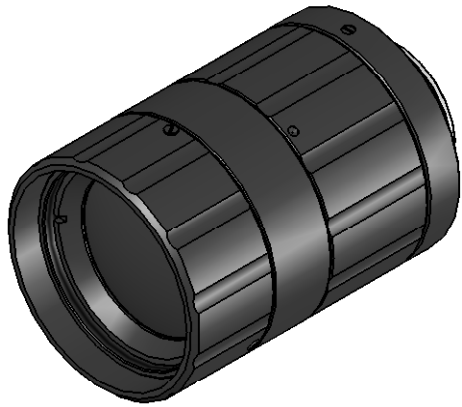
\*ALSO INCLUDES RECESSED SET SCREW OPTION

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE  
 DIMENSIONS ARE FOR REFERENCE ONLY  
 DIMENSIONS ARE IN mm [INCHES]

FOCAL LENGTH	50.00mm
FOV RANGE ON 2/3" SENSOR	42.5mm - 8.5°
FOV RANGE ON 1/2" SENSOR	31.0mm - 6.2°
FOV RANGE ON 1/3" SENSOR	23.0mm - 4.6°
WORKING DISTANCE	250mm - ∞
APERTURE (f/#)	f2 - f22

 <b>Edmund Optics®</b>	
TITLE	50mm Compact Fixed Focal Length Lens
DWG NO	59873
SHEET 1 OF 2	REV 000

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE  
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VIEW OF LENS FOCUSED TO 250mm WORKING DISTANCE

\*ALSO INCLUDES RECESSED SET SCREW OPTION



TITLE	50mm Compact Fixed Focal Length Lens		
DWG NO	59873	SHEET 2 OF 2	REV 000