TECHSPEC® HP SERIES
FIXED FOCAL LENGTH LENSES
#86-570 • 12mm • f/1.8 - f/16

TECHSPEC® 1.1" HP Series Fixed Focal Length Lenses are designed for the harsh demands of factory automation (FA) and machine vision (MV) applications. They are C-Mount and feature a locking focus and iris rings to prevent unwanted adjustments, as well as a front filter thread for integrating standard optical filters.

Focal Length:	12mm
Working Distance[1]:	100mm - ∞
Max. Sensor Format:	1.1"
Camera Mount:	C-Mount
Aperture (f/#):	f/1.8 - f/16
Distortion %[2]:	<4.5%
Object Space NA[3]:	0.025873

Magnification Range:	0X - 0.099X
Type:	Fixed Focal Length Lens
Length[4]:	70.1mm
Weight:	261g
RoHS:	Compliant
Number of Elements (Groups):	10 (9)
AR Coating:	MgF_2 (400-700nm)

1. From front housing 2. At 750mm W.D. 3. At Minimum W.D. 4. At Infinity W.D.

At Minimum W.D. (100mm)								
Sensor Size	1/4"	1/3"	1/2.5"	1/2"	1/1.8"	2/3"	1"	1.1"
Field Of View[5]	36.4mm - 17.2°	48.7mm - 22.8°	59.0mm - 27.5°	65.3mm - 30.2°	73.6mm - 33.9°	90.6mm - 41.0°	134.6mm - 57.6°	149.2mm - 62.5°

5. Horizontal FOV on Standard 4:3 sensor format. Min W.D.

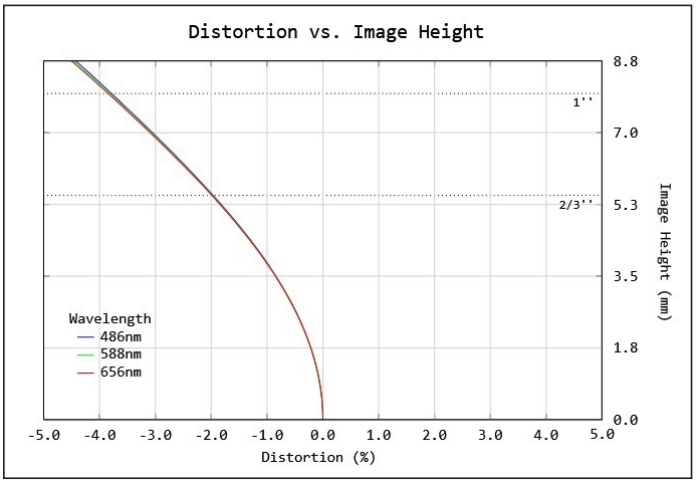

Figure 1: Distortion at the maximum sensor format. Positive values correspond to pincushion distortion, negative values correspond to barrel distortion.

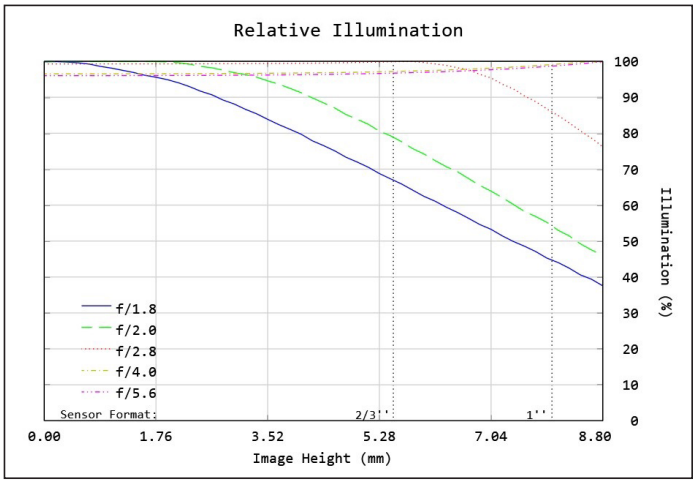

Figure 2: Relative illumination (center to corner)

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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MTF & DOF: f/2.8
WD: 150mm
HORIZONTAL FOV: 211mm

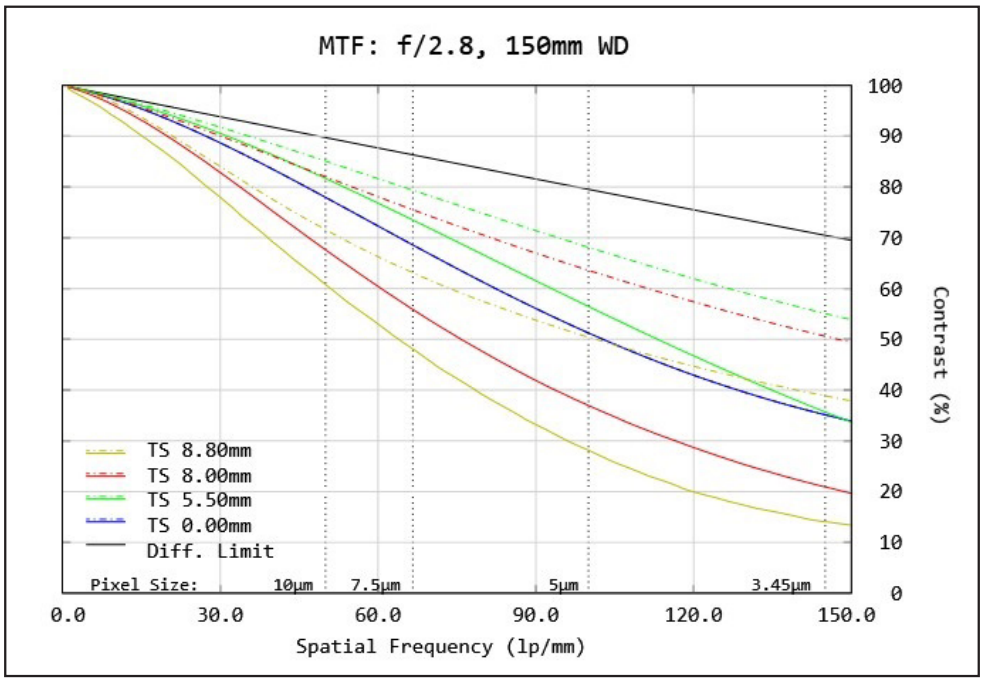

Figure 3: Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for λ = 486nm to 656nm. Included are the Tangential and Sagittal values for field points on center, at 70% of full field, the optimized sensor format, and the maximum sensor format. Solid black line indicates diffraction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

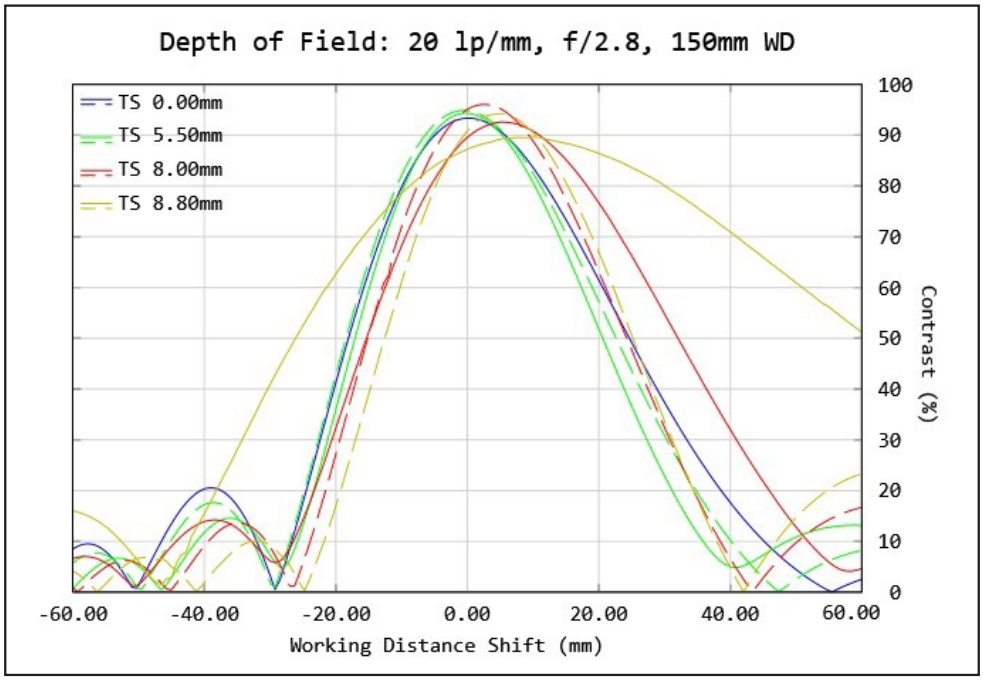

Figure 4: Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

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

MTF & DOF: f/4.0
WD: 150mm
HORIZONTAL FOV: 211mm

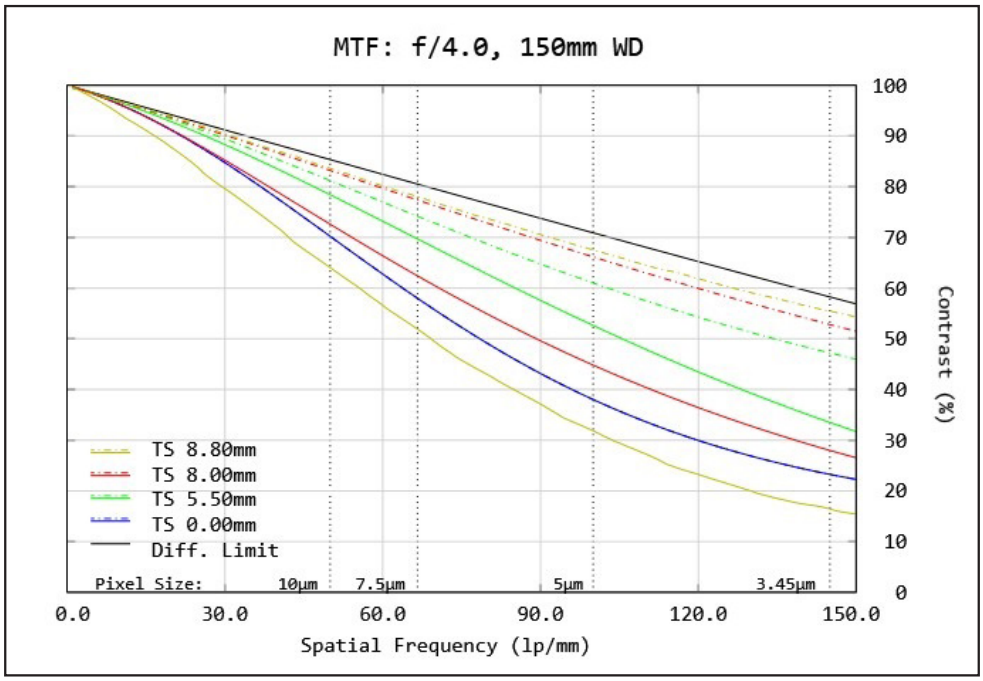

Figure 5: Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for λ = 486nm to 656nm. Included are the Tangential and Sagittal values for field points on center, at 70% of full field, the optimized sensor format, and the maximum sensor format. Solid black line indicates diffraction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

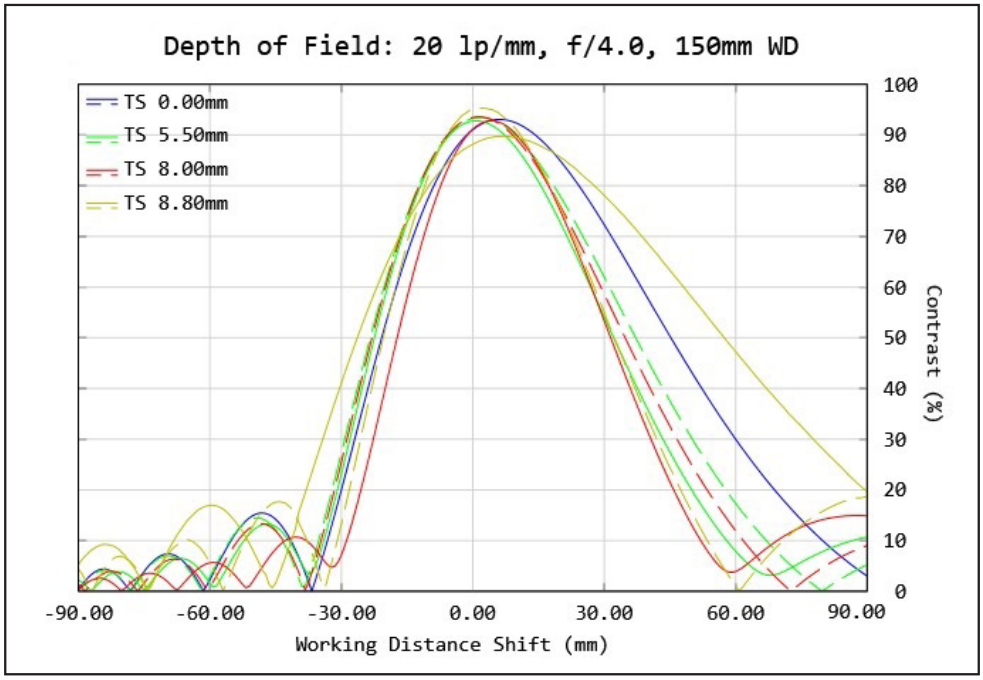

Figure 6: Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

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

MTF & DOF: f/2.8
WD: 309mm
HORIZONTAL FOV: 400mm

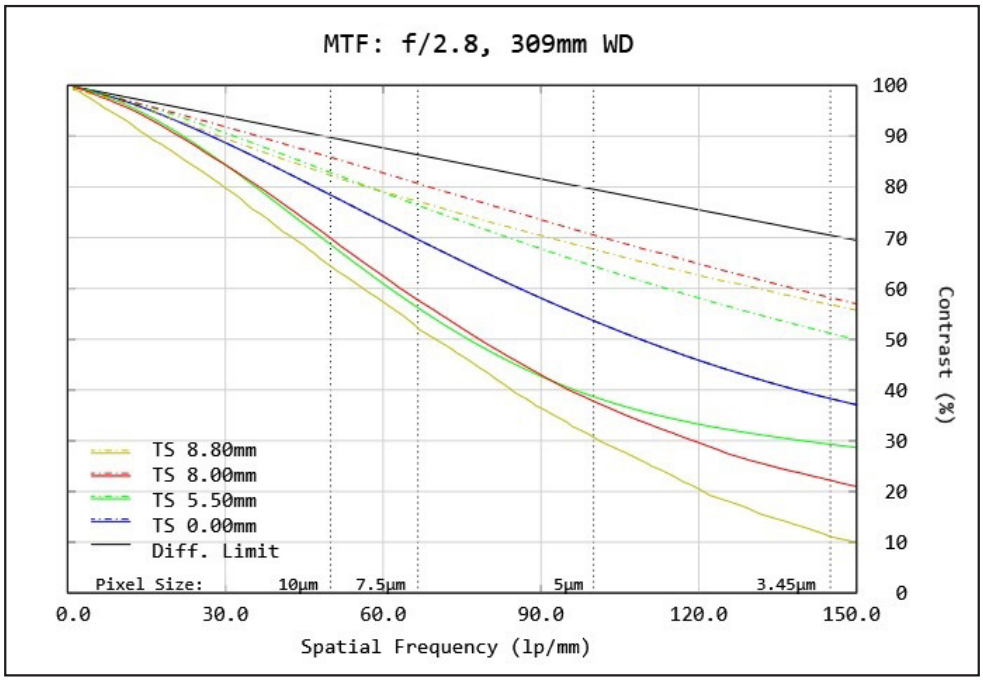

Figure 7: Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for λ = 486nm to 656nm. Included are the Tangential and Sagittal values for field points on center, at 70% of full field, the optimized sensor format, and the maximum sensor format. Solid black line indicates diffraction limit determined by f/#-defined aperture. Frequencies corresponding to the Nyquist resolution limit of pixel sizes are indicated.

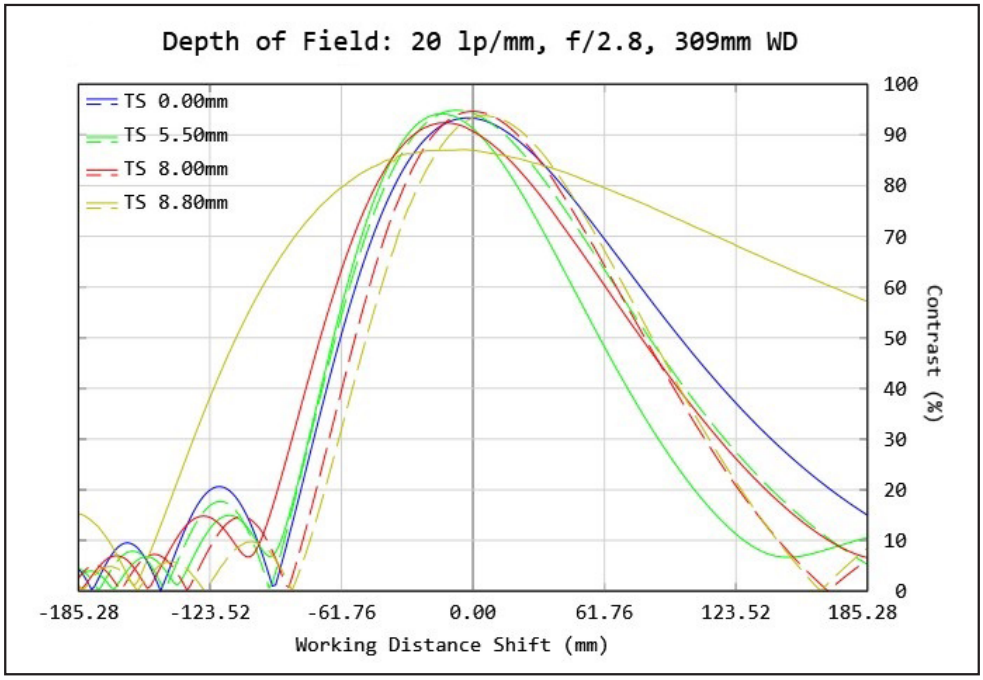

Figure 8: Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

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

MTF & DOF: f/4.0
WD: 309mm
HORIZONTAL FOV: 400mm

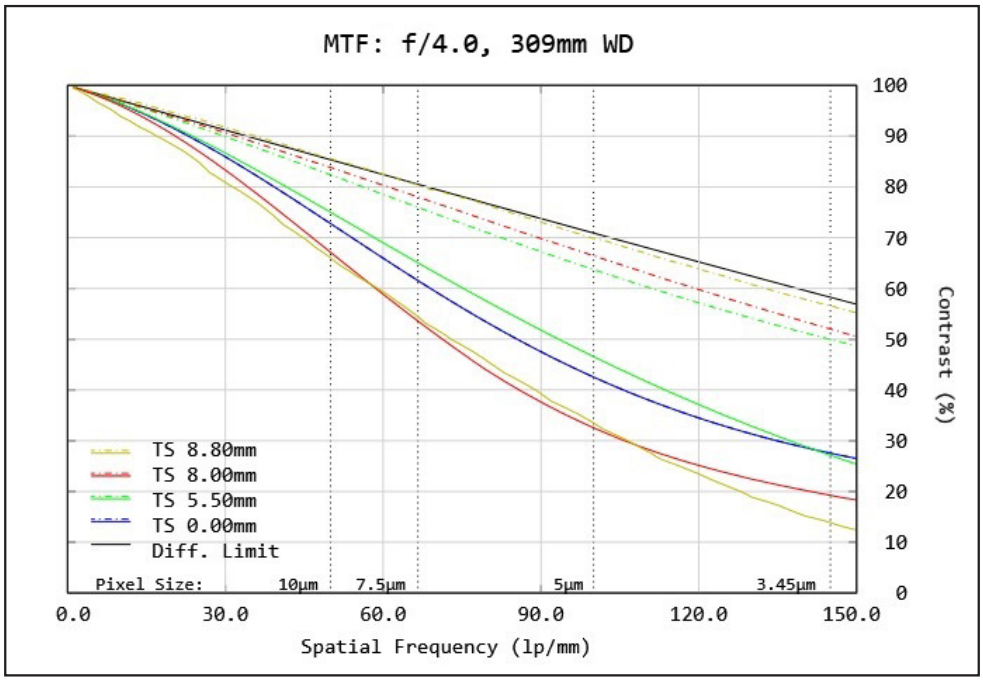

Figure 9: Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for λ = 486nm to 656nm. Included are the Tangential and Sagittal values for field points on center, at 70% of full field, the optimized sensor format, and the maximum sensor format. Solid black line indicates diffraction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

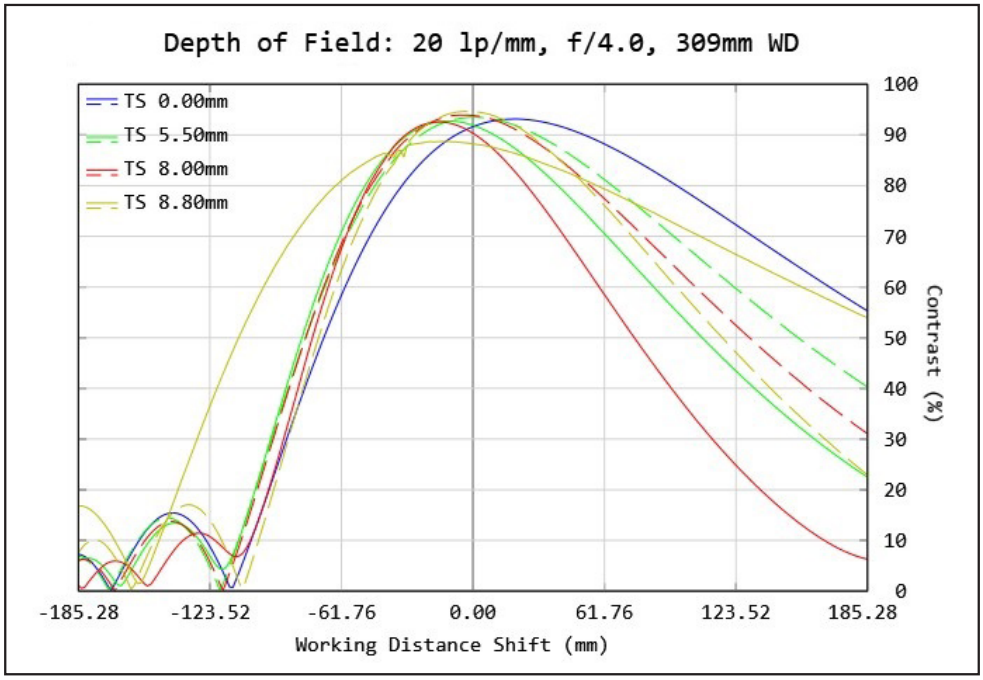

Figure 10: Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

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