TECHSPEC® HP SERIES
FIXED FOCAL LENGTH LENSES
#86-569 • 8mm • 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. The 8mm, 12mm, 16mm, 25mm, and 35mm lenses are compatible with 1" and 1.1" sensor formats, while the 50mm lens is compatible with up to 4/3" sensor formats. The f/1.8 and f/2.8 apertures provide increased light throughput and high resolution performance.

Focal Length:	8mm
Working Distance[1]:	100mm - ∞
Max. Sensor Format:	1.1"
Camera Mount:	C-Mount
Aperture (f/#):	f/1.8 - f/16
Distortion %[2]:	<3%
Object Space NA[3]:	0.017417

Magnification Range:	0X - 0.063X
Type:	Fixed Focal Length Lens
Length[4]:	83.45mm
Weight:	347g
RoHS:	Compliant
Number of Elements (Groups):	10 (8)
AR Coating:	400-700nm MgF_2

1. From front housing 2. At 500mm 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]	57.0mm - 25.5°	76.5mm - 33.7°	92.9mm - 40.3°	102.9mm - 44.1°	116.3mm - 49.1°	143.7mm - 58.6°	214.9mm - 78.4°	238.5mm - 83.5°

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

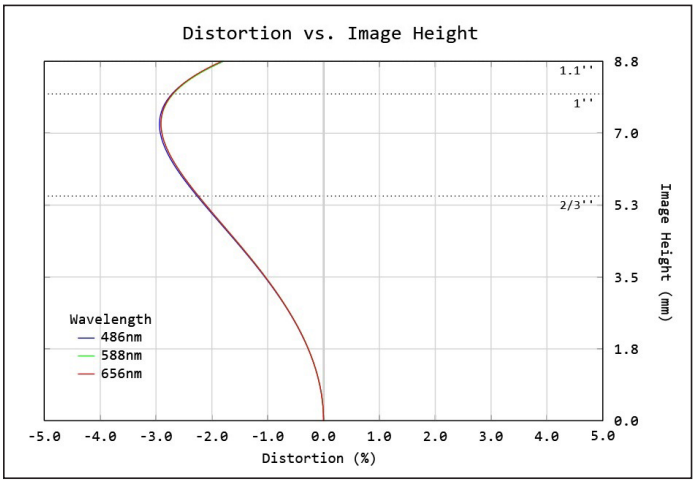

Figure 1: Distortion at the maximum sensor format. Positive values correspond to pincushion distortion, negative values correspond to barrel distortion.

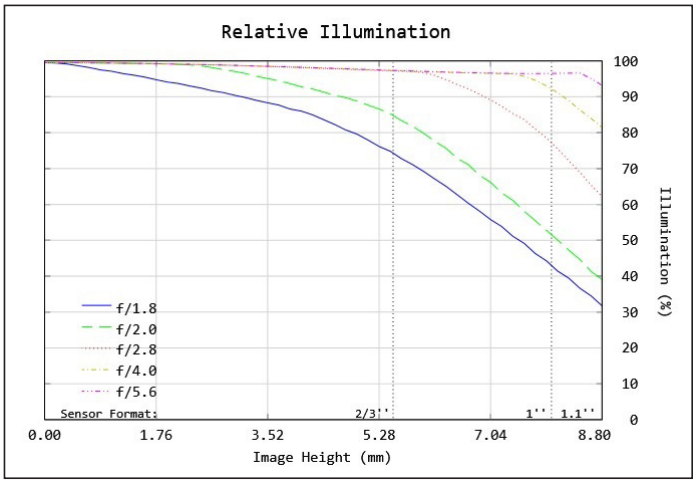

Figure 2: Relative illumination (center to corner)

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.

MTF & DOF: f/2.8
WD: 200mm
HORIZONTAL FOV: 418mm

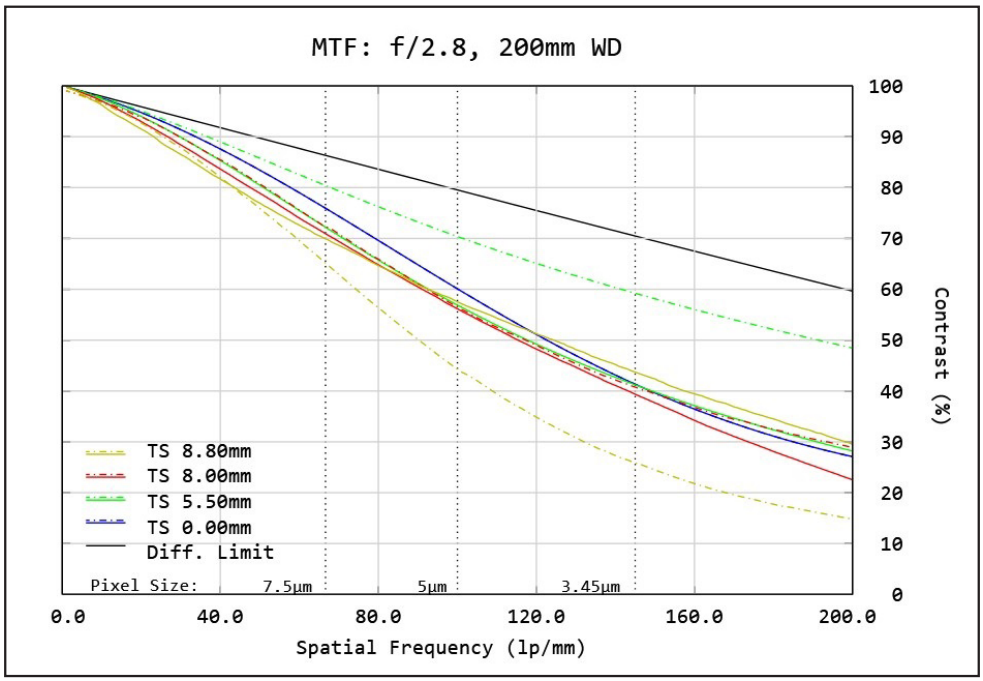

Figure 3: Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for λ = 486nm to 656nm. Included are the Tangential and Sagittal values for field points on center, at 70% of full field, the optimized sensor format, and the maximum sensor format. Solid black line indicates diffraction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

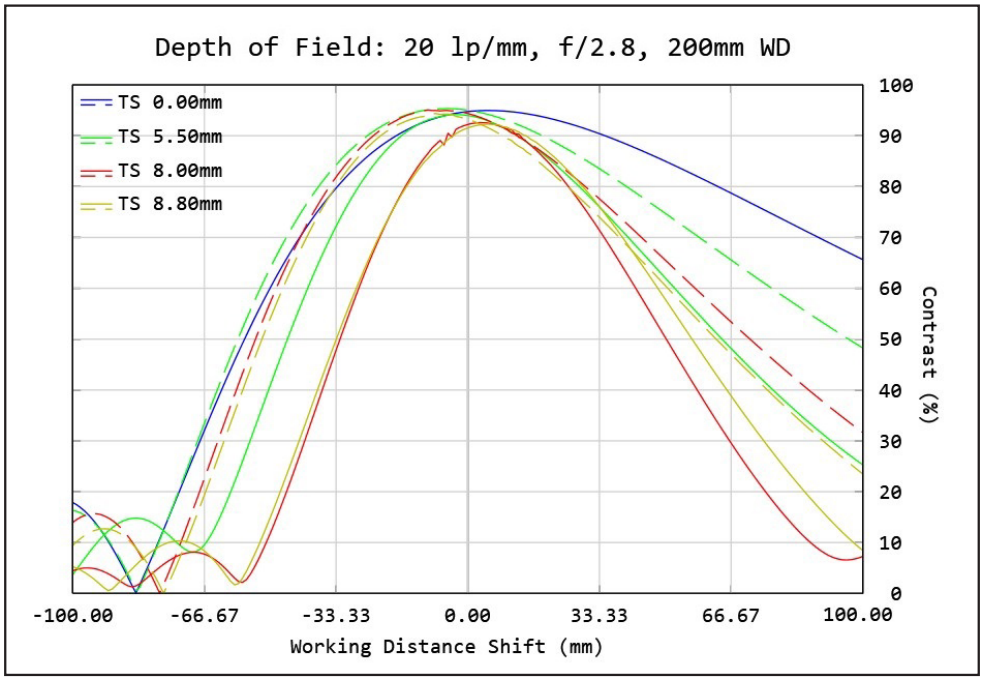

Figure 4: Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

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

MTF & DOF: f/4.0
WD: 200mm
HORIZONTAL FOV: 418mm

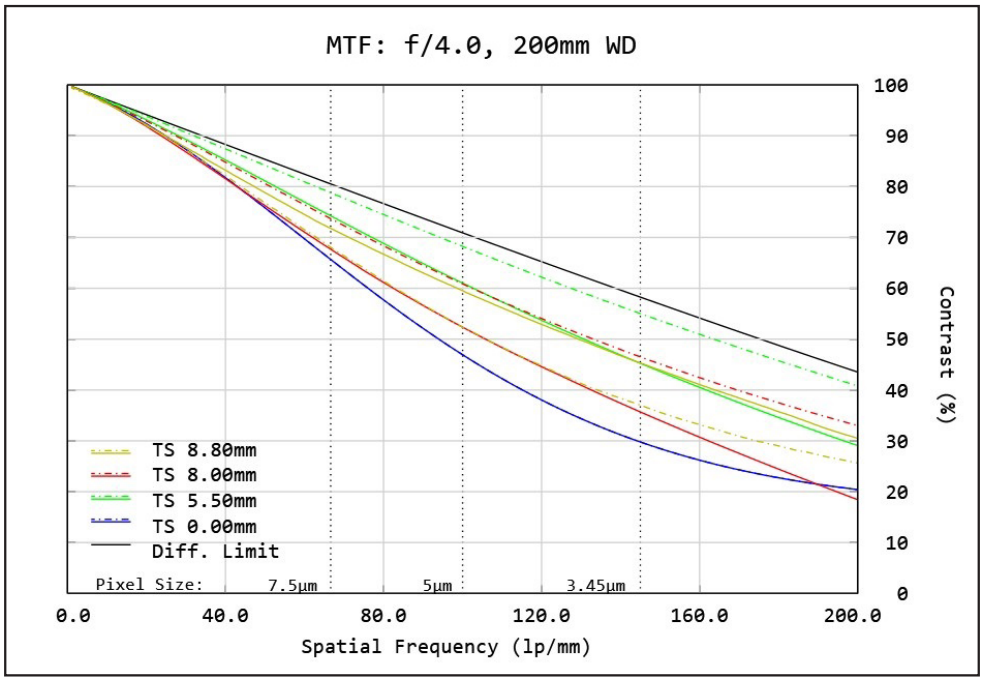

Figure 5: Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for λ = 486nm to 656nm. Included are the Tangential and Sagittal values for field points on center, at 70% of full field, the optimized sensor format, and the maximum sensor format. Solid black line indicates diffraction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

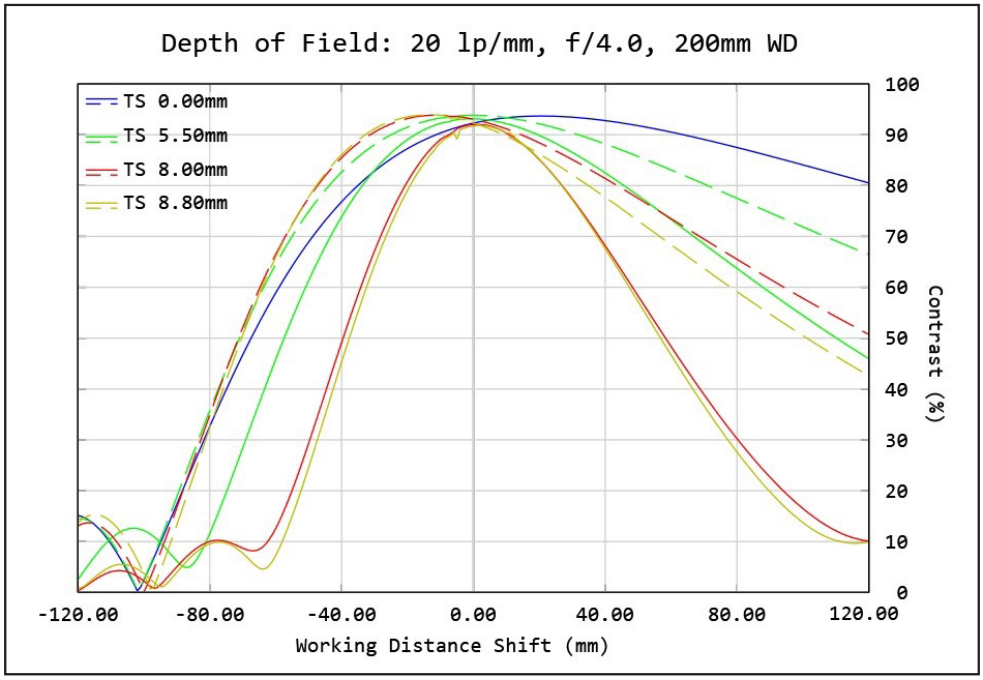

Figure 6: Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

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

MTF & DOF: f/2.8
WD: 302mm
HORIZONTAL FOV: 600mm

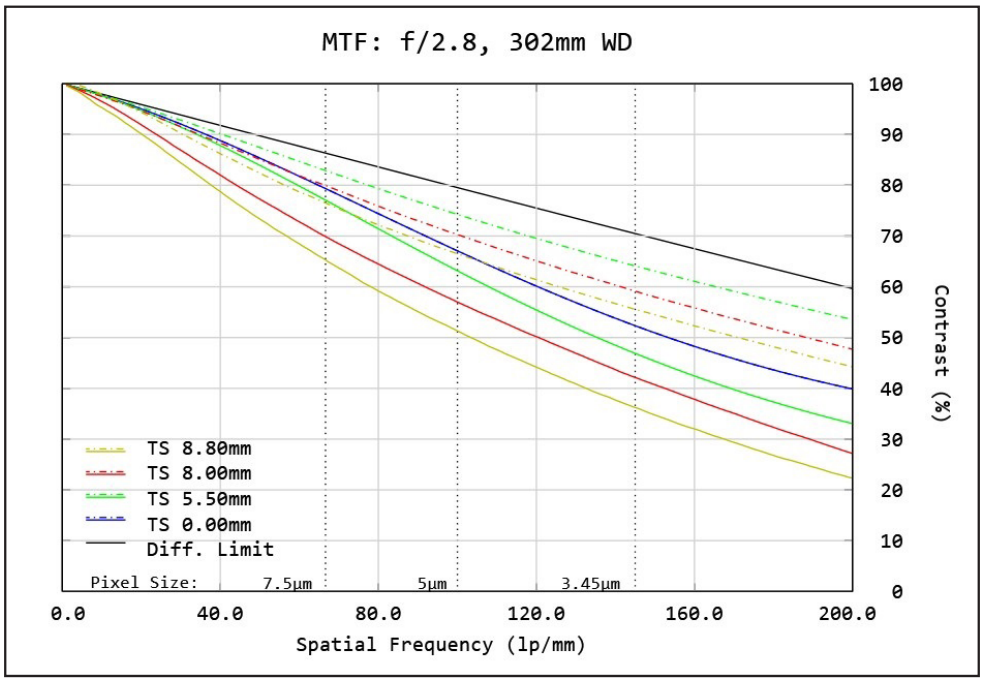

Figure 7: Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for λ = 486nm to 656nm. Included are the Tangential and Sagittal values for field points on center, at 70% of full field, the optimized sensor format, and the maximum sensor format. Solid black line indicates diffraction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

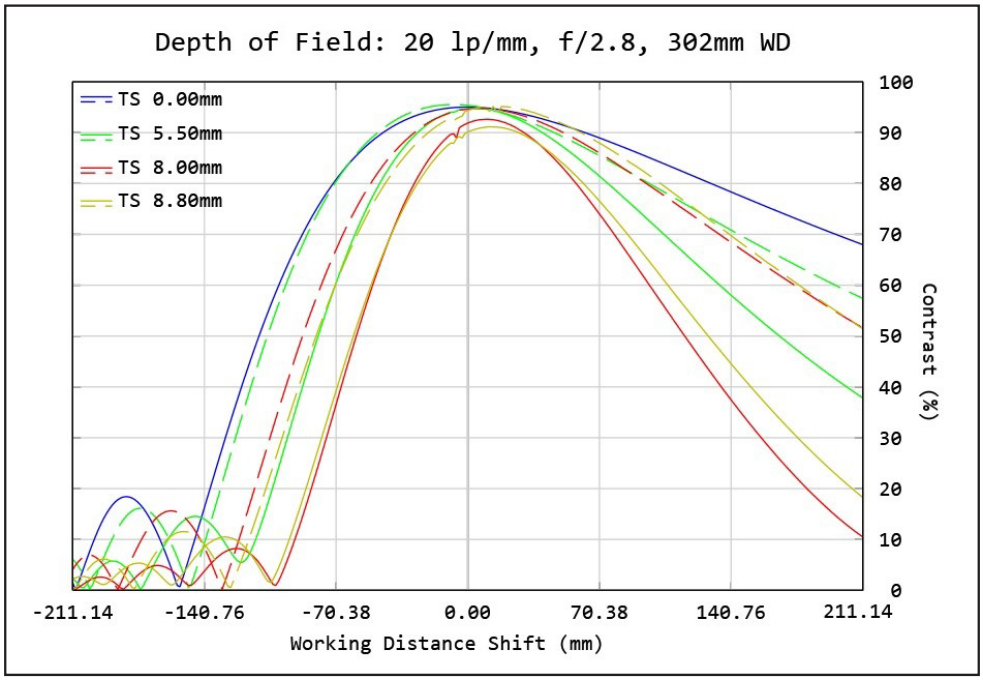

Figure 8: Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

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

MTF & DOF: f/4.0
WD: 302mm
HORIZONTAL FOV: 600mm

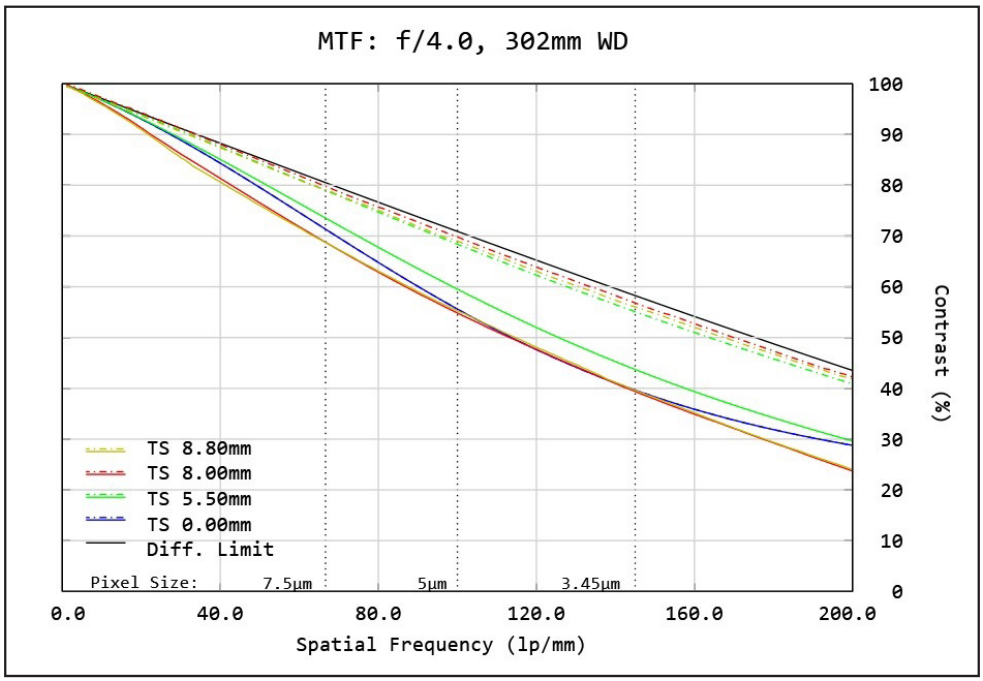

Figure 9: Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for λ = 486nm to 656nm. Included are the Tangential and Sagittal values for field points on center, at 70% of full field, the optimized sensor format, and the maximum sensor format. Solid black line indicates diffraction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

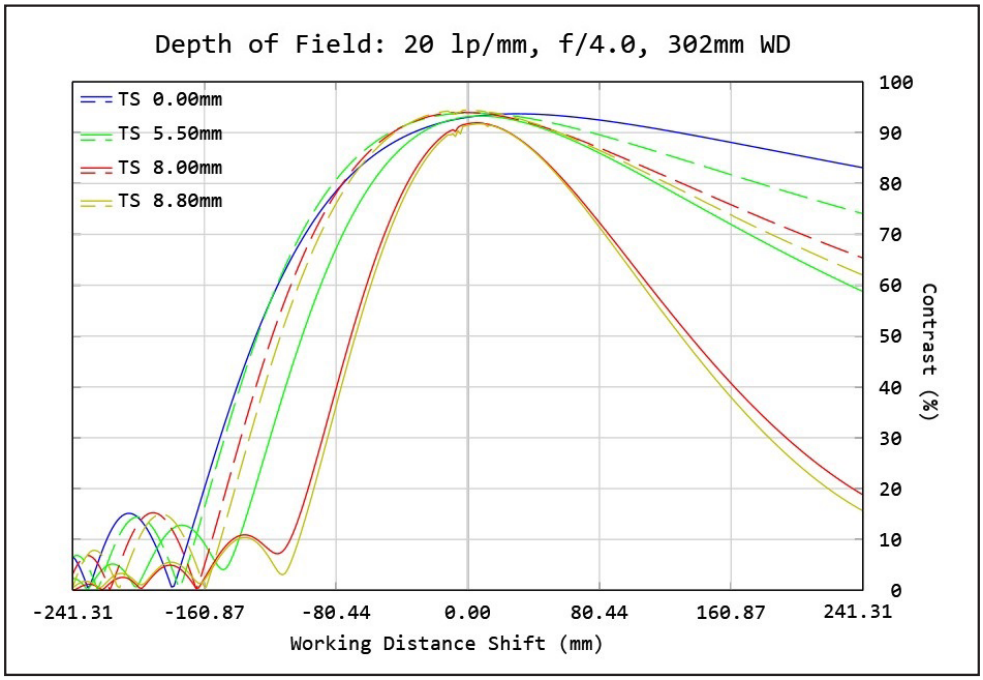

Figure 10: Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

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