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TECHSPEC® UC SERIES FIXED FOCAL LENGTH LENSES
#33-302 • 8mm FL • f/1.8



Our ultra-compact, TECHSPEC® UC Series Fixed Focal Length Lenses are designed to optimize performance, cost, and size without sacrificing quality or feel. Designed for pixels that are ≤2.2µm, these lenses provide high levels of resolution (>200 lp/mm) across the sensor and are compatible with all standard C-Mount cameras. TECHSPEC® UC Series Fixed Focal Length Lenses feature focus and iris adjustments, as well as recessed set screws, and are manufactured for use at typical machine vision working distances. While they are optimized for 1/2.5" sensors, many focal lengths will work on sensors up to 1/1.8". The TECHSPEC® UC Series lenses are an outstanding option for use on all smaller format camera sensors, along with both short and long working distance applications, making them ideal for inspection, factory automation, biomedical devices, and a broad range of other applications.

Focal Length:	8mm
Minimum Working Distance[1]:	50mm
Focus Range:	50mm - ∞
Length at Near Focus:	34.52mm
Length at Far Focus:	33.56mm
Filter Thread:	M39.0 x 0.5[3]
Max. Sensor Format:	1/2"
Optimized Sensor Format:	1/2.5"

Camera Mount:	C-Mount
Aperture (f/#):	f/1.8 - f/11
Magnification Range:	0X - 0.16X
Distortion:	<4% (on 1/2.5" sensor)
Object Space NA:	0.03
Number of Elements (Groups):	8 (7)
AR Coating:	¼ λ MgF_2
Weight:	57g

Sensor Size	1/4"	1/3"	1/2.5"	1/2"	1/1.8	2/3"	1"	4/3"
Field of View[2]	22.13mm - 24.96°	29.5mm - 32.87°	35.65mm - 39.24°	40mm - 43.6°	NA	NA	NA	NA

1. From front of housing 2. Horizontal FOV on standard 4:3 sensor format. Min. W.D. - angular FOV at infinite conjugate 3. With required thread adapter #33-309 Specifications subject to change

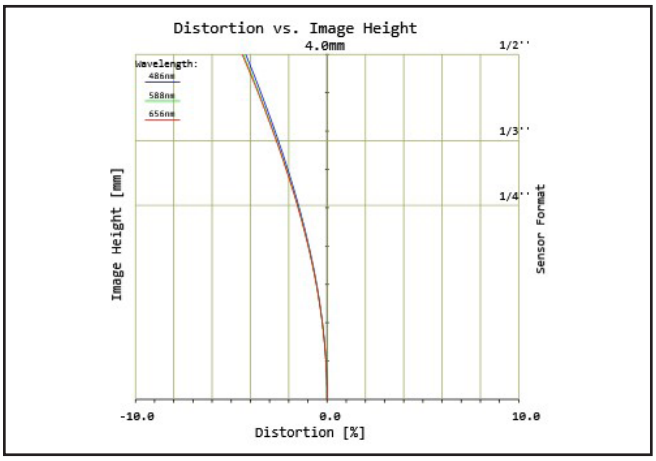


Figure 1: Distortion at the maximum sensor format. Postive values correspond to pincushion distortion, negative values correspond to barrel distortion.

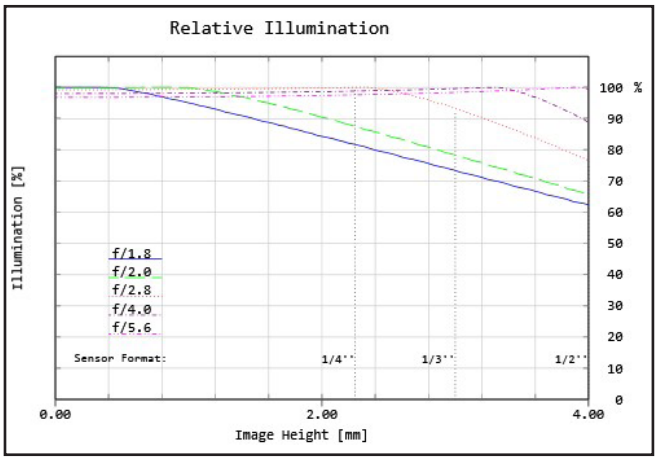


Figure 2: Relative illumination (center to corner)

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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TECHSPEC® UC SERIES FIXED FOCAL LENGTH LENSES
#33-302 • 8mm FL • f/1.8

MTF & DOF: f/1.8
WD: 100mm

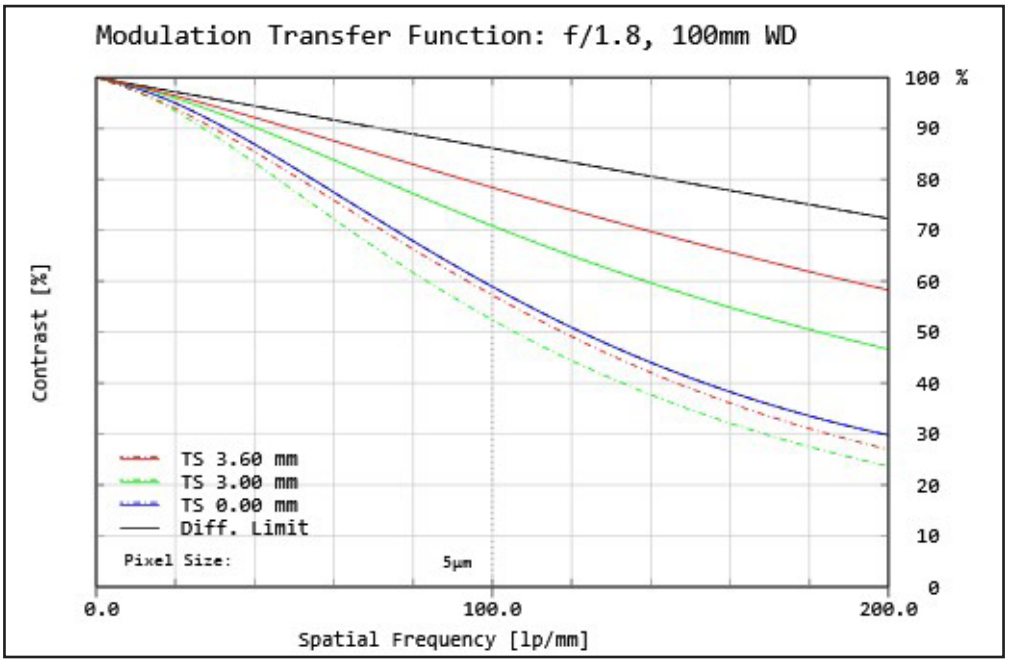


Figure 3: Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for λ = 486nm to 656nm. Included are Tangential and Sagittal values for field points on center, at 70% of full field and at the maximum sensor format. Solid black line indicates diffraction limit determined by f/#-defined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

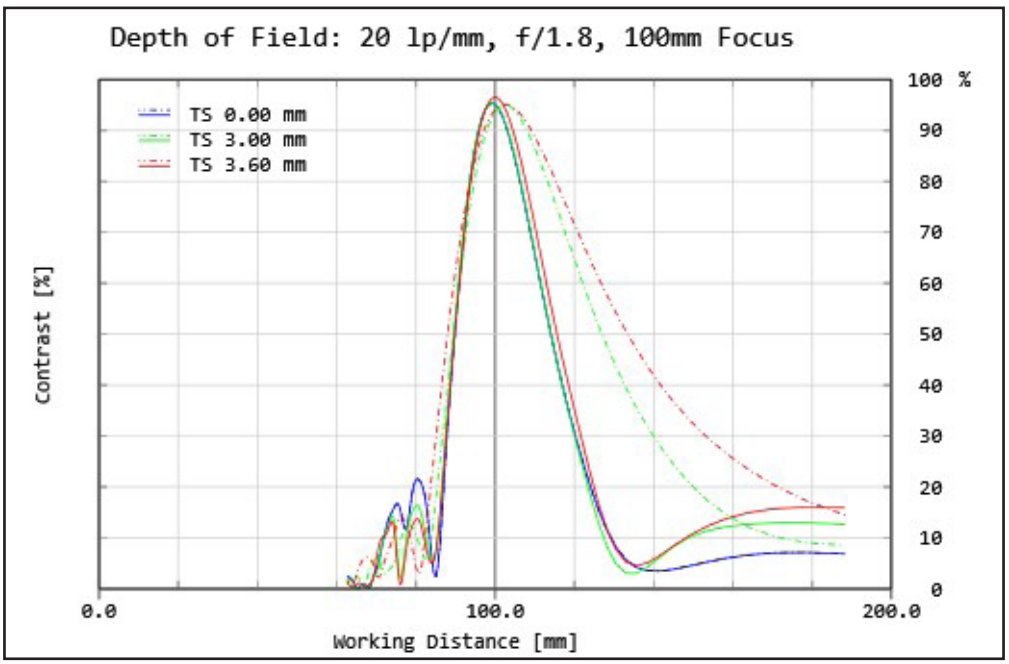


Figure 4: Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

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

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TECHSPEC® UC SERIES FIXED FOCAL LENGTH LENSES
#33-302 • 8mm FL • f/1.8

MTF & DOF: f/1.8
WD: 200mm

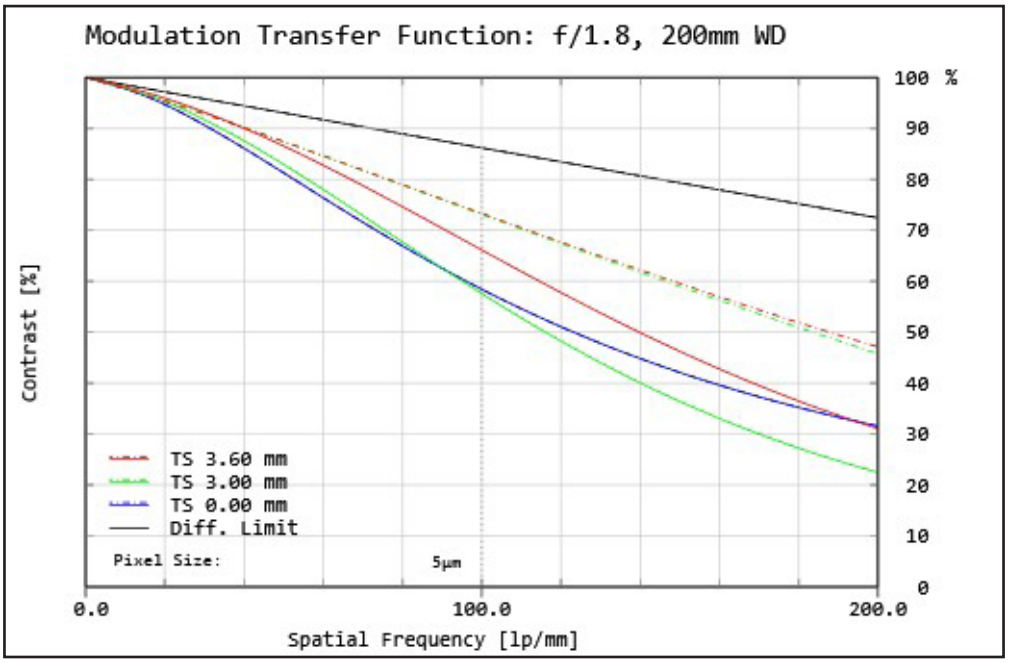


Figure 5: Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for λ = 486nm to 656nm. Included are Tangential and Sagittal values for field points on center, at 70% of full field and at the maximum sensor format. Solid black line indicates diffraction limit determined by f/#-defined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

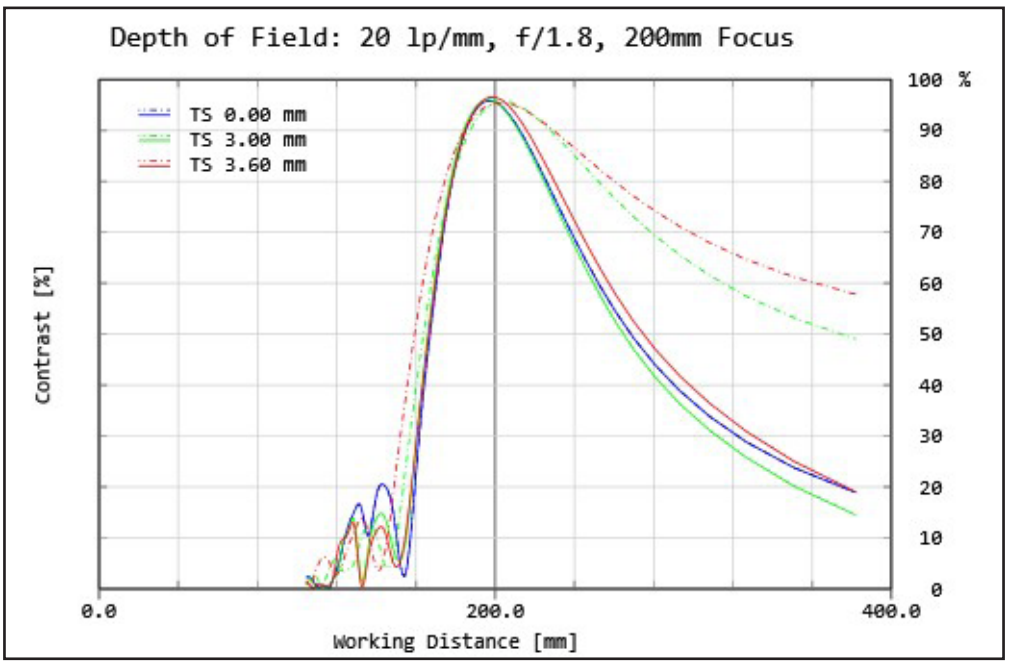


Figure 6: Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

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TECHSPEC® UC SERIES FIXED FOCAL LENGTH LENSES
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MTF & DOF: f/4.0
WD: 100mm

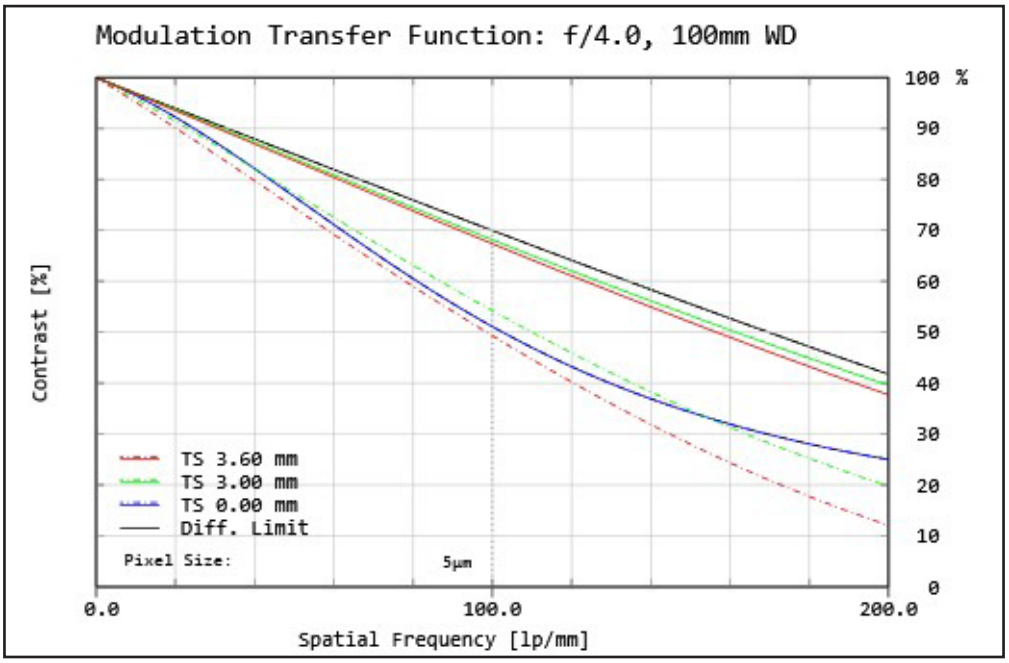


Figure 7: Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for λ = 486nm to 656nm. Included are Tangential and Sagittal values for field points on center, at 70% of full field and at the maximum sensor format. Solid black line indicates diffraction limit determined by f/#-defined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

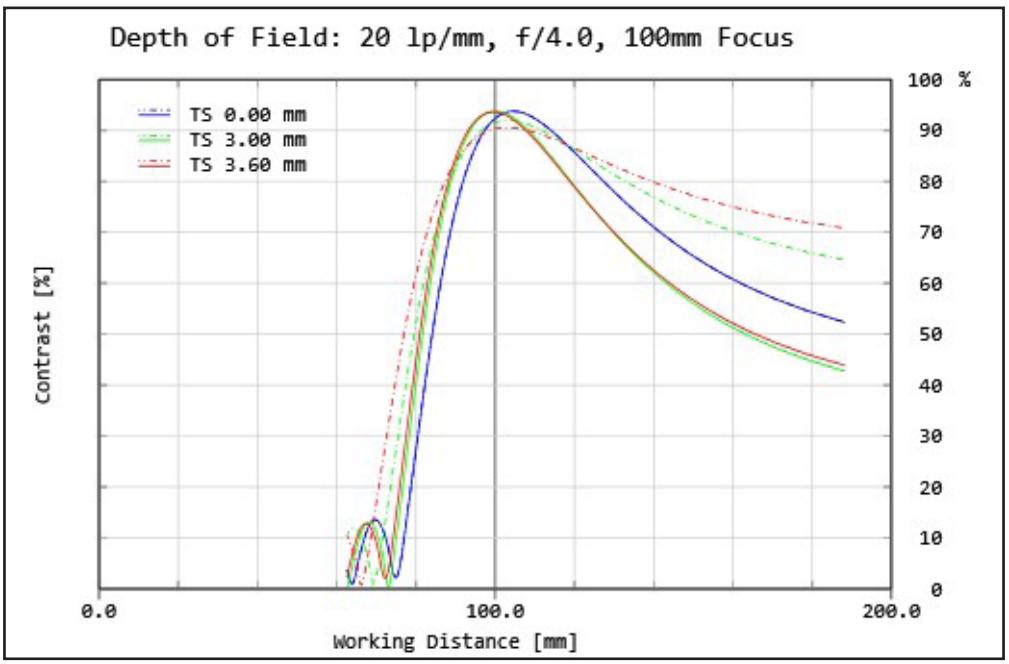


Figure 8: Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

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TECHSPEC® UC SERIES FIXED FOCAL LENGTH LENSES

#33-302 • 8mm FL • f/1.8

MTF & DOF: f/4.0
WD: 200mm

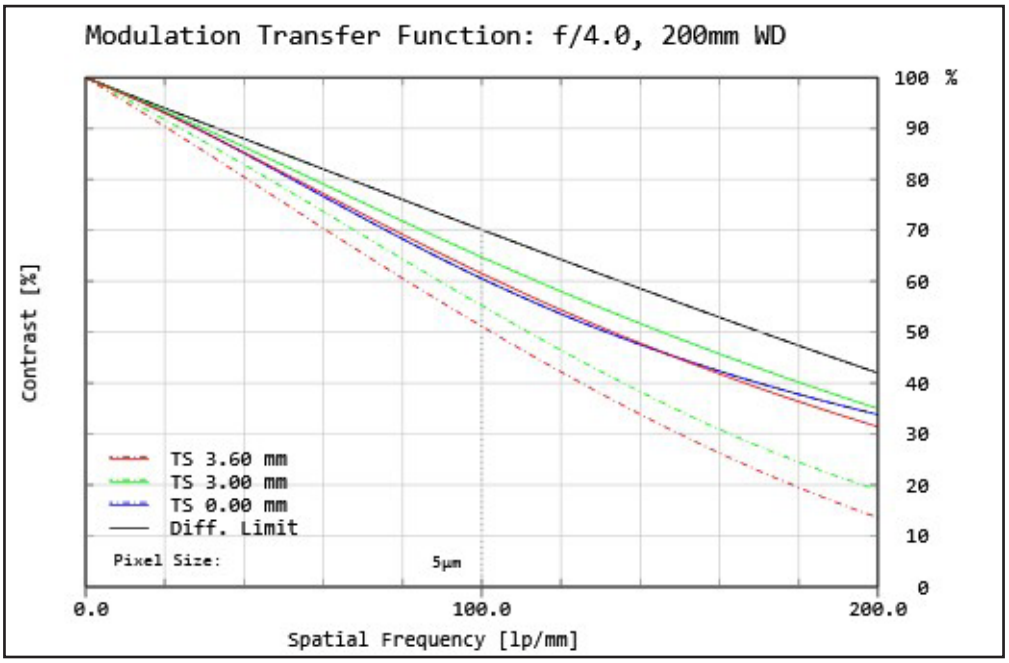


Figure 9: Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for λ = 486nm to 656nm. Included are Tangential and Sagittal values for field points on center, at 70% of full field and at the maximum sensor format. Solid black line indicates diffraction limit determined by f/#-defined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

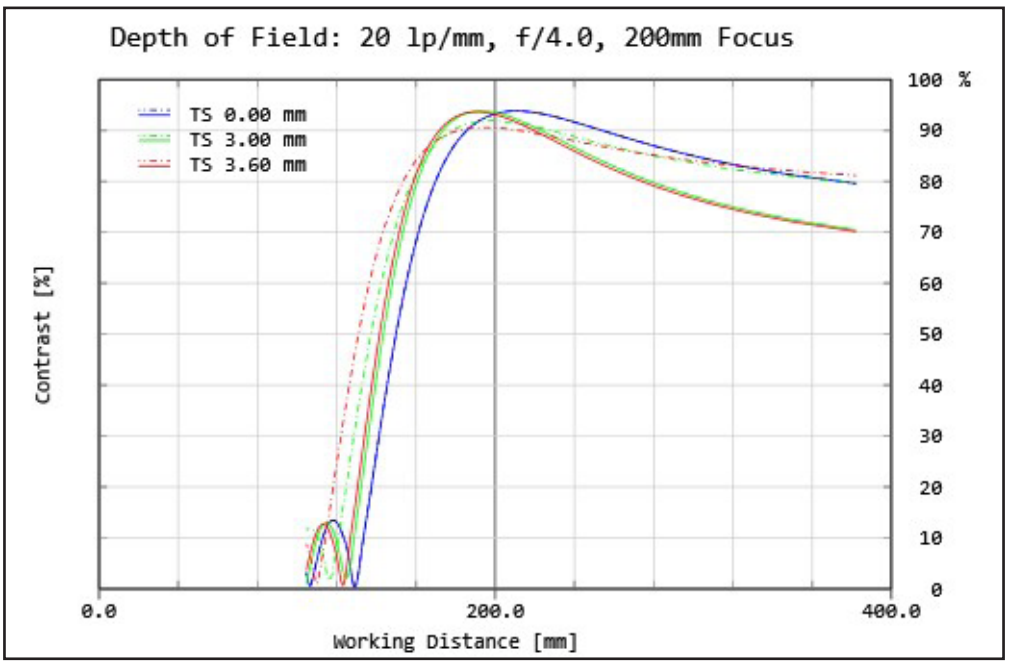


Figure 10: Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

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