

# TECHSPEC® HIGH RESOLUTION LENSES FOR 1" AND 4/3" SENSORS #86-574 • 50mm

Our TECHSPEC® High Resolution Lenses for 1" and 4/3" Sensors are designed for the harsh demands of industrial inspection applications and are ideal for use in factory automation, inspection or qualification. These fixed focal length lenses feature a locking focus and iris rings to prevent unwanted adjustments, and a front filter thread for integrating standard optical filters.



|  |             |
|--|-------------|
| <b>Focal Length:</b>                         | 50mm        |
| <b>Minimum Working Distance<sup>1</sup>:</b> | 200mm       |
| <b>Focus Range<sup>1</sup> (lockable):</b>   | 200mm – ∞   |
| <b>Length at Near Focus:</b>                 | 72.6mm      |
| <b>Length at Far Focus:</b>                  | 60.5mm      |
| <b>Filter Thread:</b>                        | M37.5 x 0.5 |
| <b>Max. Sensor Format:</b>                   | 4/3"        |
| <b>Camera Mount:</b>                         | C-mount     |

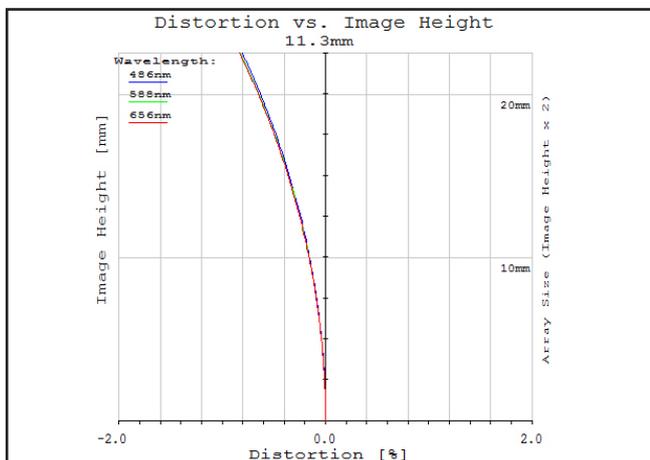
|                                     |                              |
|-------------------------------------|------------------------------|
| <b>Aperture (f/#):</b>              | f/1.8 - f/16, lockable       |
| <b>Magnification Range:</b>         | 0X – 0.25X                   |
| <b>Distortion<sup>2</sup>:</b>      | <1%                          |
| <b>Object Space NA<sup>2</sup>:</b> | 0.026                        |
| <b>No. of Elements (Groups):</b>    | 7 (5)                        |
| <b>AR Coating:</b>                  | 1/4λ M.F <sub>2</sub> @550nm |
| <b>Weight:</b>                      | 295g                         |

| Sensor Size                      | 1/2.5"        | 1/2"          | 1/1.8"        | 2/3"           | Sony 2/3" *   | 1"             | 1" Sq †        | 4/3"           |
|----------------------------------|---------------|---------------|---------------|----------------|---------------|----------------|----------------|----------------|
| <b>Field of View<sup>3</sup></b> | 23.5mm - 6.5° | 26.3mm - 7.3° | 29.6mm - 8.2° | 36.3mm - 10.1° | 34.8mm - 9.7° | 52.9mm - 14.6° | 46.4mm - 12.8° | 75.1mm - 20.5° |

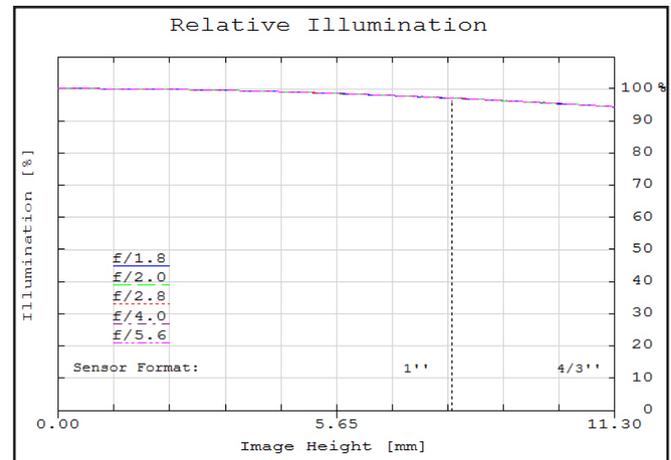
1. From front of housing    2. At 500mm W.D.    3. Horizontal FOV on standard 4:3 sensor format

†1" 1:1 aspect ratio sensor    \*6:5 aspect ratio

Specifications subject to change



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

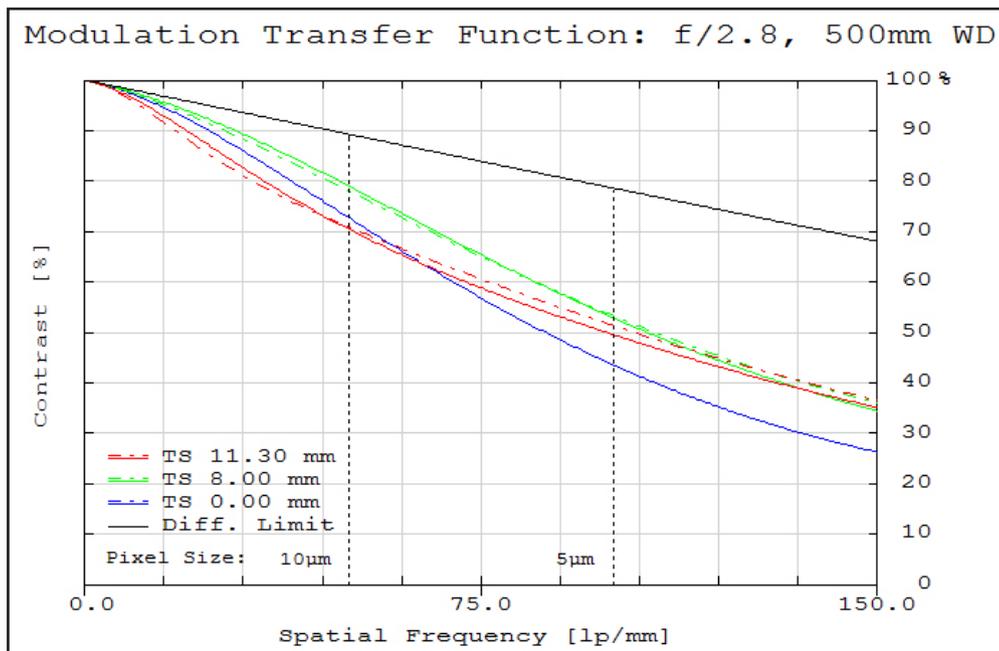


**Figure 2:** Relative illumination (center to corner)

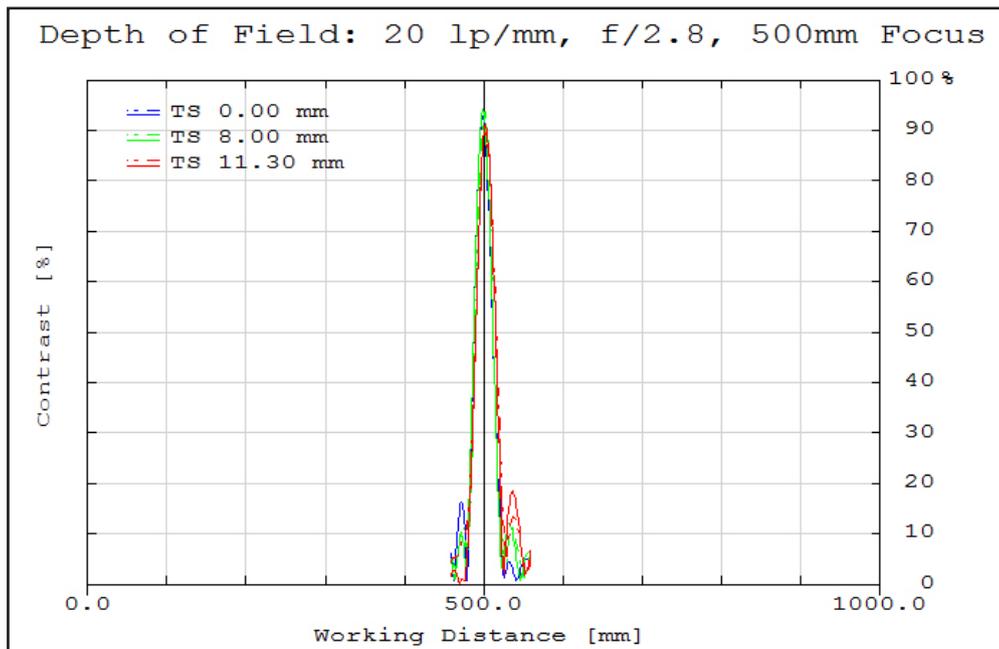
In both plots, field points corresponding to the image circle of common sensor formats are included. Plots represent theoretical values from lens design software. Actual lens performance varies due to manufacturing tolerances.

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**MTF & DOF: f/2.8**  
**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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MTF & DOF: f/4.0  
 WD: 500mm

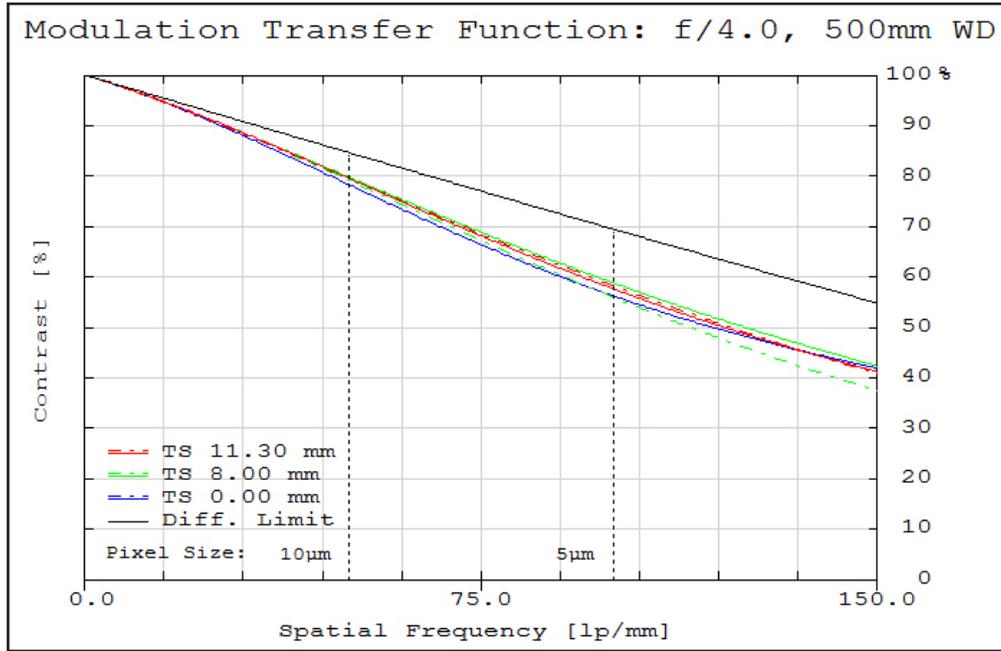


Figure 5: Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for  $\lambda = 486\text{nm}$  to  $656\text{nm}$ . Included are Tangential and Sagittal values for field points on center, at 70% of full field and at the maximum sensor format. Solid black line indicates diffraction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

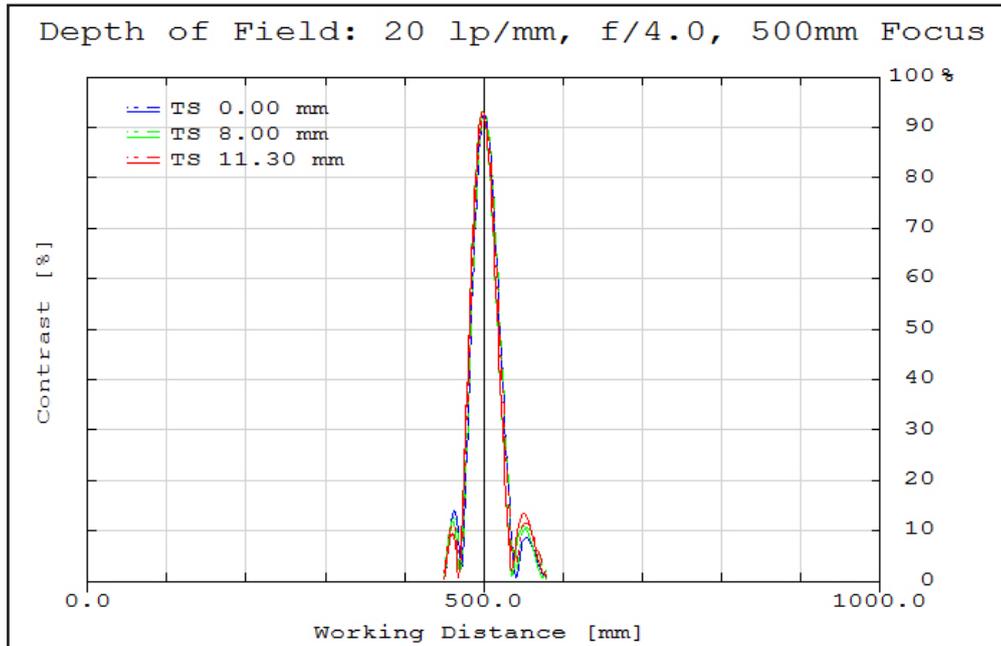
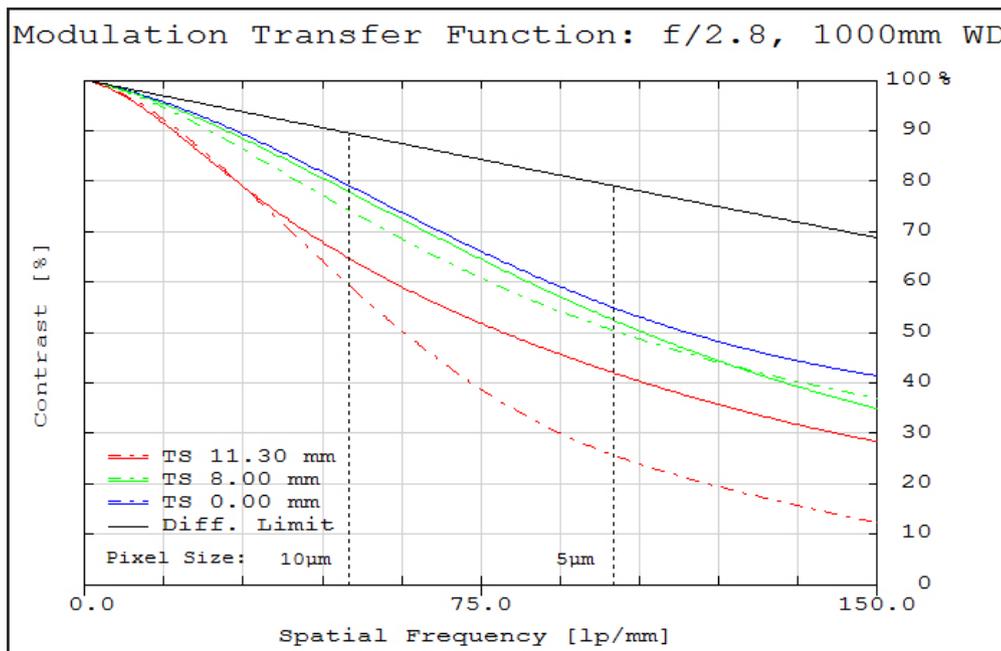


Figure 6: Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

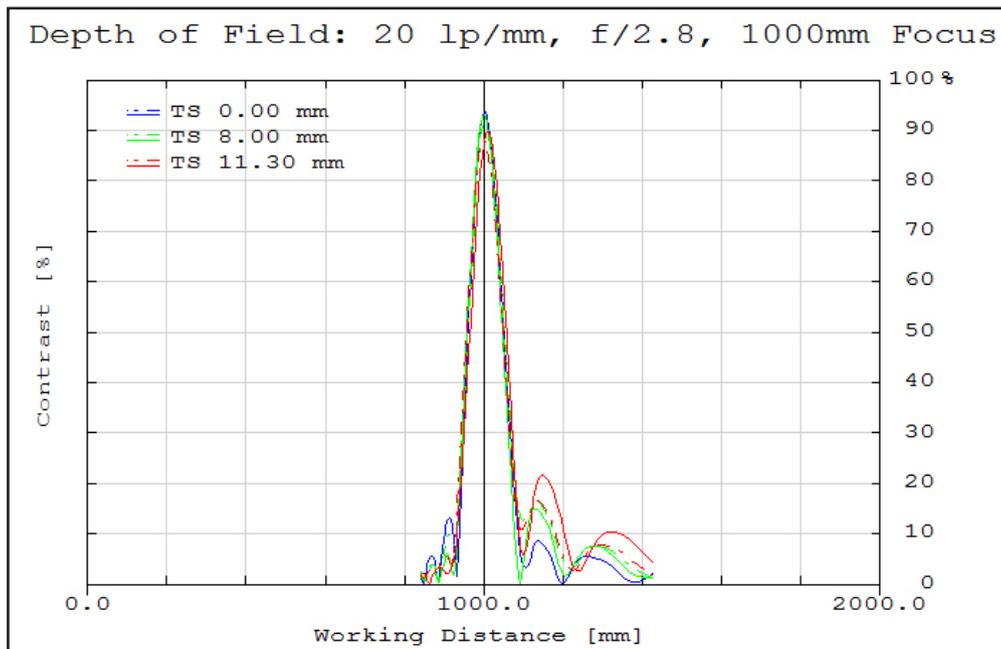
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**MTF & DOF: f/2.8**  
**WD: 1000mm**



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 WD: 1000mm

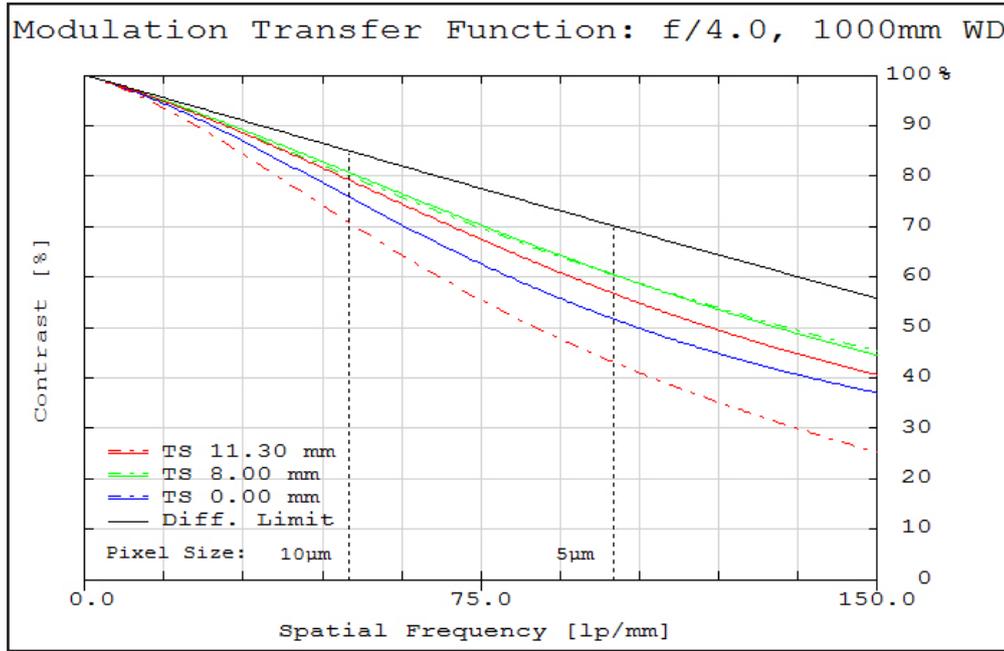


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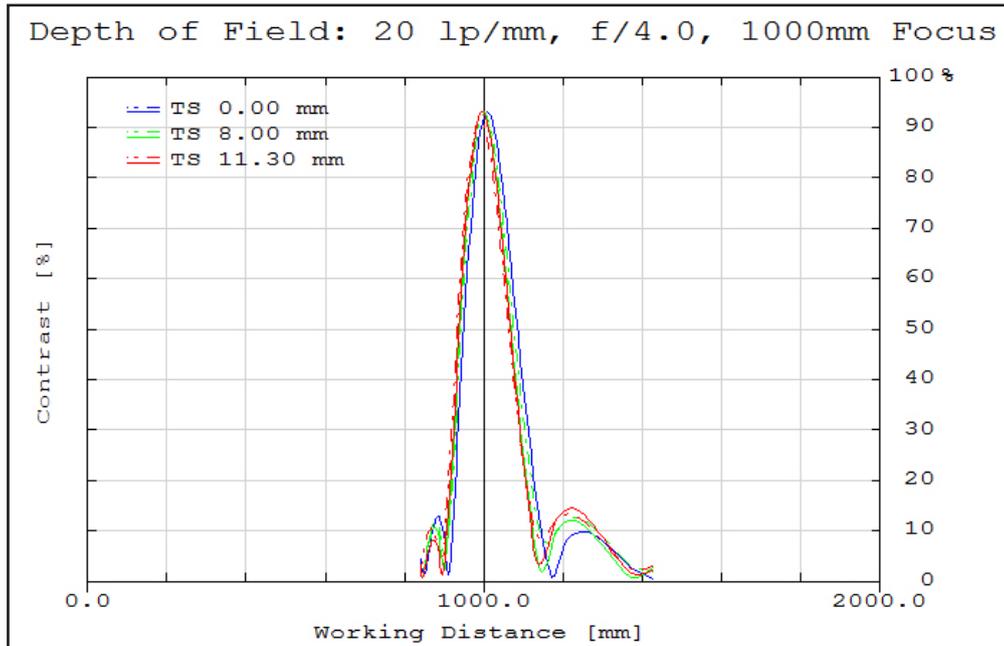


Figure 6: Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

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