

# TECHSPEC® SILVER SERIES TELECENTRIC LENS

#56-675 • 175mm WD • 0.16X

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Our TECHSPEC® Silver Series Telecentric Measuring Lenses offer a compact, cost-effective solution for replacing standard fixed focal length lenses. Telecentric lenses are ideal for both on-line and off-line machine vision production environments that require accurate measurements. Edmund Optics has designed this series of machine vision lenses to specifically replace lenses that give inaccurate or inconsistent readings. Telecentric lenses correct perspective errors that yield variations in magnification through the depth of field.



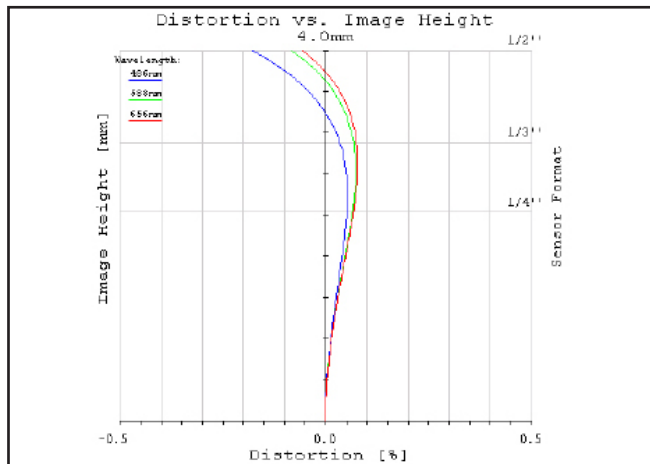
|                                      |                                 |
|--------------------------------------|---------------------------------|
| <b>Primary Magnification:</b>        | 0.16X                           |
| <b>Working Distance<sup>1</sup>:</b> | 175mm ±3mm                      |
| <b>Depth of Field<sup>2</sup>:</b>   | ±19.7mm at f10 (20% @ 20 lp/mm) |
| <b>Length:</b>                       | 190.8mm                         |
| <b>Filter Thread:</b>                | M62 x 0.75                      |
| <b>Max. Sensor Format:</b>           | 1/2"                            |
| <b>Camera Mount:</b>                 | C-Mount                         |

|                                     |                        |
|-------------------------------------|------------------------|
| <b>Telecentricity:</b>              | <0.1°                  |
| <b>Distortion:</b>                  | <0.3%                  |
| <b>Resolution<sup>2</sup>:</b>      | >40% @ 40 lp/mm        |
| <b>Aperture (f/#):</b>              | f/6 - closed, lockable |
| <b>Object Space NA:</b>             | 0.008                  |
| <b>Number of Elements (Groups):</b> | 8 (6)                  |
| <b>AR Coating:</b>                  | 425 - 675nm BBAR       |
| <b>Weight:</b>                      | 500g                   |

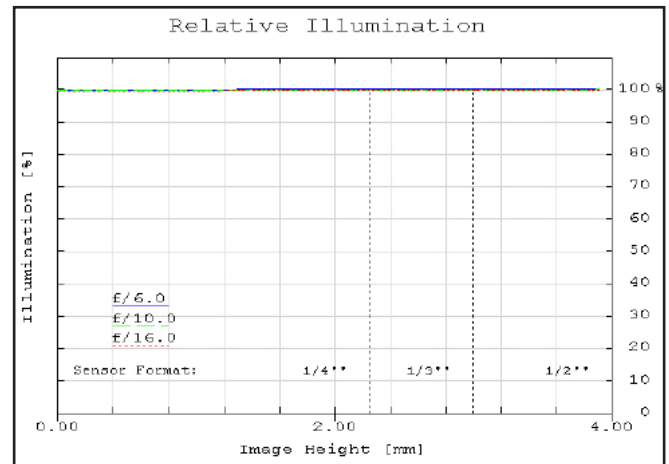
| Sensor Size                      | 1/4"   | 1/3"   | 1/2.5" | 1/2"   | 1/1.8" | 2/3" | 1"  | 4/3" |
|----------------------------------|--------|--------|--------|--------|--------|------|-----|------|
| <b>Field of View<sup>3</sup></b> | 22.5mm | 30.0mm | 35.6mm | 40.0mm | N/A    | N/A  | N/A | N/A  |

1. From front of housing 2. Image space MTF contrast 3. Horizontal FOV on standard 4:3 sensor format

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.

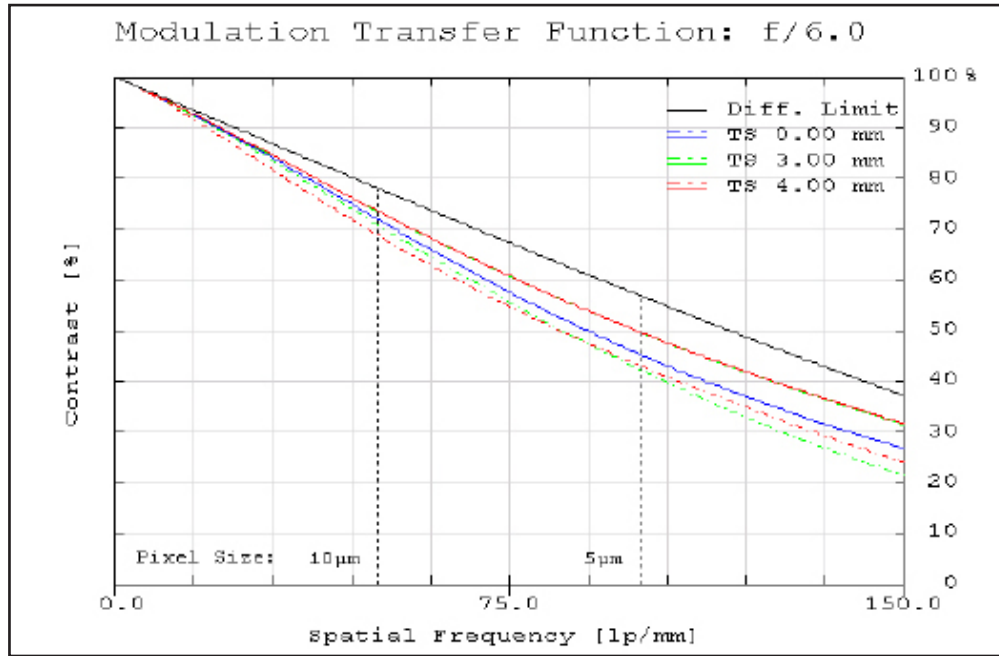
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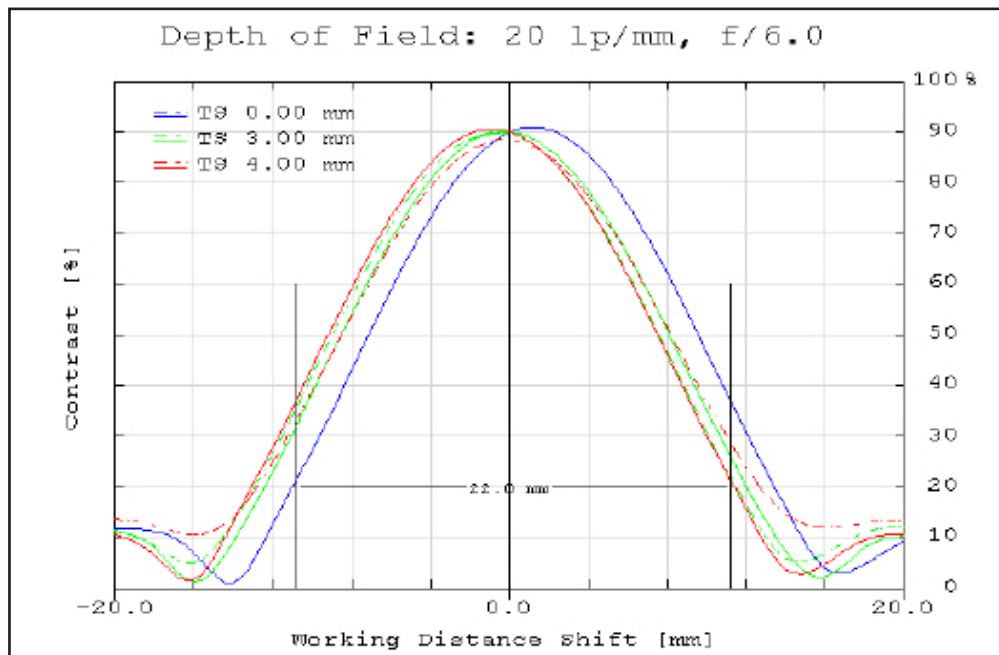
MTF & DOF: f/6.0

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**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). The depth of field at the maximum sensor format for the plotted frequency and  $f/\#$  at 20% contrast is indicated by the measurement bars.

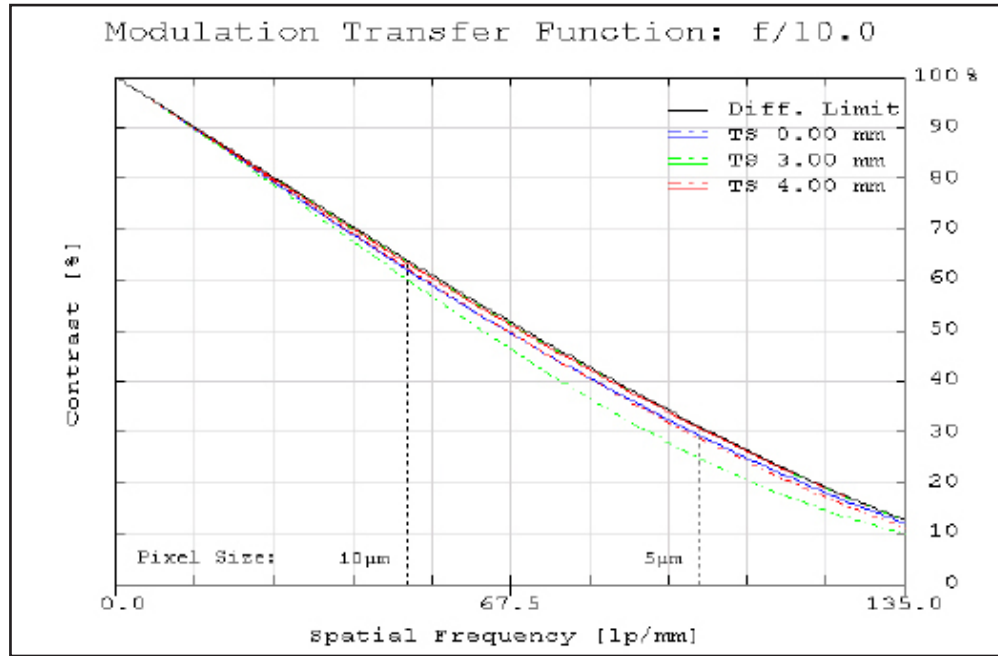
Plots represent theoretical values from lens design software. Actual lens performance varies due to manufacturing tolerances.

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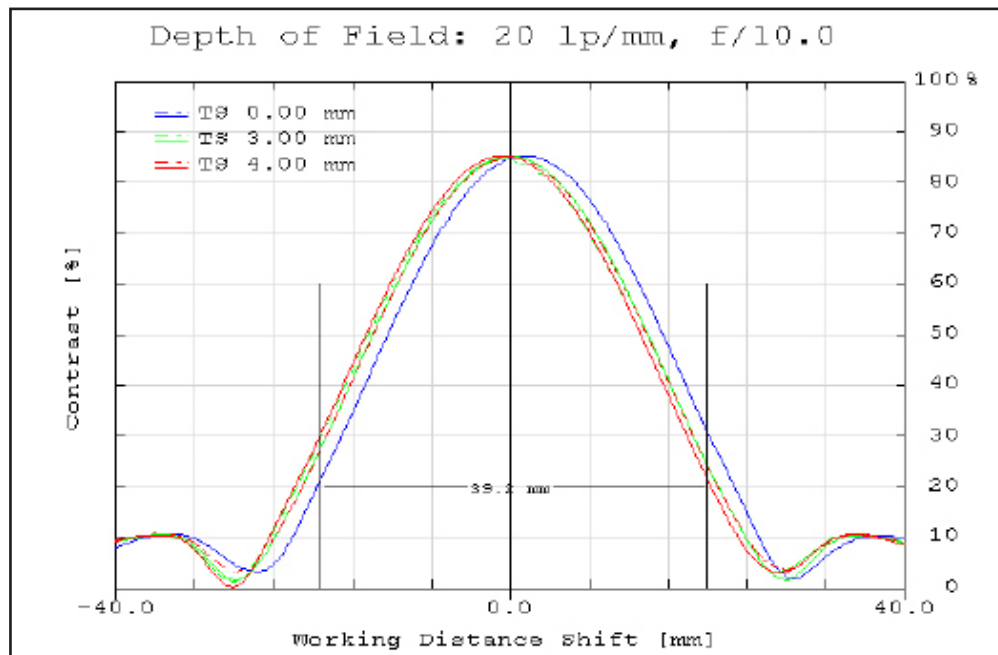
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MTF & DOF: f/10.0

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**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). The depth of field at the maximum sensor format for the plotted frequency and  $f/\#$  at 20% contrast is indicated by the measurement bars.

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