

# TECHSPEC® TitanTL™

## TELECENTRIC LENSES

### #34-026 • f/16.0

TECHSPEC® TitanTL™ Telecentric Lenses are designed for machine vision systems and metrology applications that require a large field of view. These lenses feature large maximum sensor formats, a variety of working distance and magnification options, and a rear filter holder on the back of the lenses to allow for easy filter integration. On our 118mm, 182mm and 242mm FOV versions, the integrated mounting flange allows for ease of securing each lens without requiring an additional mount and provides an easy to locate reference plane.



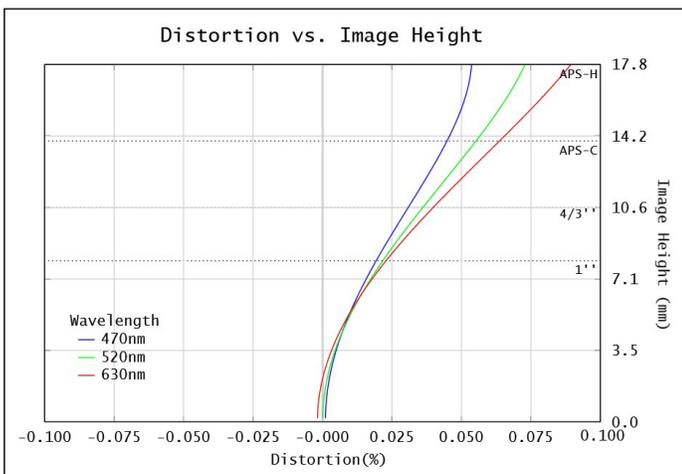
<b>Primary Magnification:</b>	0.368X
<b>Working Distance<sup>1</sup>:</b>	169mm
<b>Depth of Field<sup>2</sup>:</b>	±6.6mm (20% @ 20 lp/mm, f/16)
<b>Max. Sensor Format:</b>	APS-H
<b>Camera Mount:</b>	M42 x 1.0
<b>Aperture (f/#):</b>	f/16.0
<b>Distortion %:</b>	<0.073%
<b>Object Space NA:</b>	0.0115

<b>Telecentricity:</b>	<0.036°
<b>Type:</b>	Telecentric Lens
<b>Length:</b>	358.47mm
<b>Front Diameter:</b>	150mm
<b>Weight:</b>	3.833kg
<b>RoHS:</b>	Compliant
<b>Number of Elements (Groups):</b>	7 (5)
<b>AR Coating:</b>	MgF <sub>2</sub> (400-700nm)

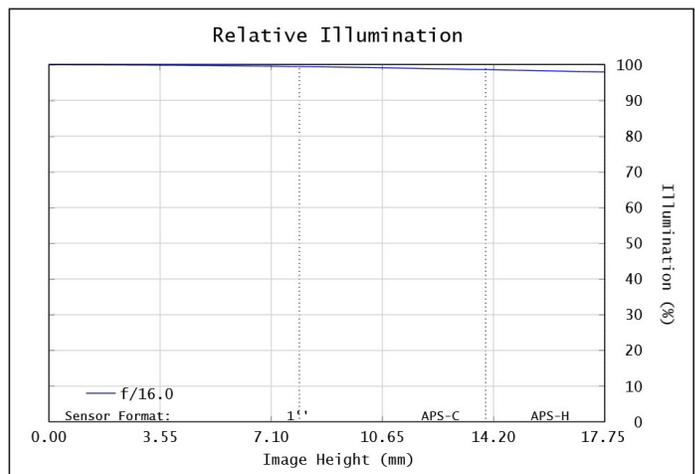
1. From front housing 2. Image space MTF contrast

At 169mm W.D.											
Sensor Size	1/4"	1/3"	1/2.5"	1/2"	1/1.8"	2/3"	1"	1.1"	4/3"	APS-C	APS-H
<b>Field Of View<sup>3</sup></b>	9.8mm	13.1mm	15.8mm	17.4mm	19.6mm	23.9mm	34.8mm	38.6mm	47.1mm	60.9mm	79.5mm

3. Horizontal FOV on Standard (4:3) sensor format.



**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/16.0

WD: 169mm

HORIZONTAL FOV: 79.5mm

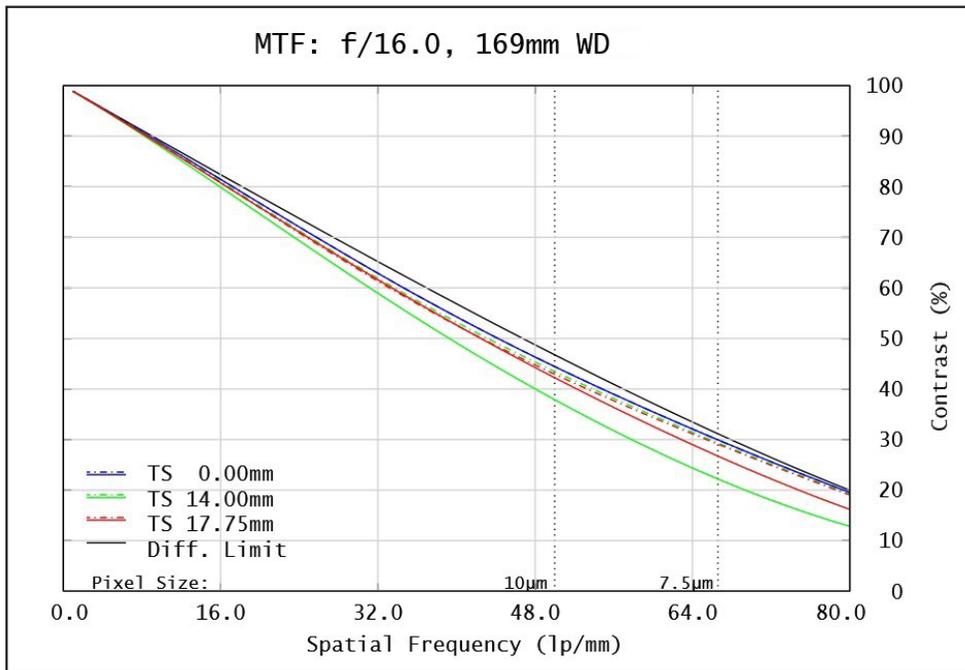


Figure 3: Image space polychromatic diffraction FFT Modulation Transfer Function (MTF) for  $\lambda = 486\text{nm}$  to  $656\text{nm}$ . Included are the Tangential and Sagittal values for field points on center, at 70% of full field and the maximum sensor format. Solid black line indicates diffraction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

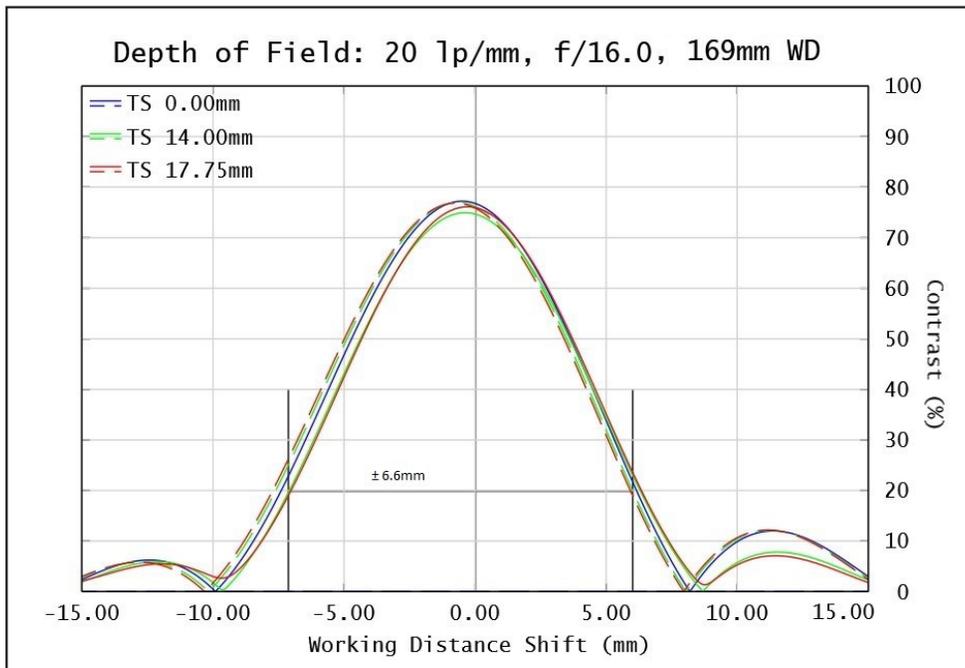


Figure 4: Polychromatic diffraction through-focus MTF at 20 linepairs/mm (image space). Contrast is plotted to two times the focus distance. Note object spatial frequency changes with working distance.

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