
vicotar® TO60/8.0-280-V-WN-LD

Short description: Telecentric measuring lens, C-mount, sensor opt. 1/2", variable aperture, VIS/NIR, LD
Order number: 2-05-393

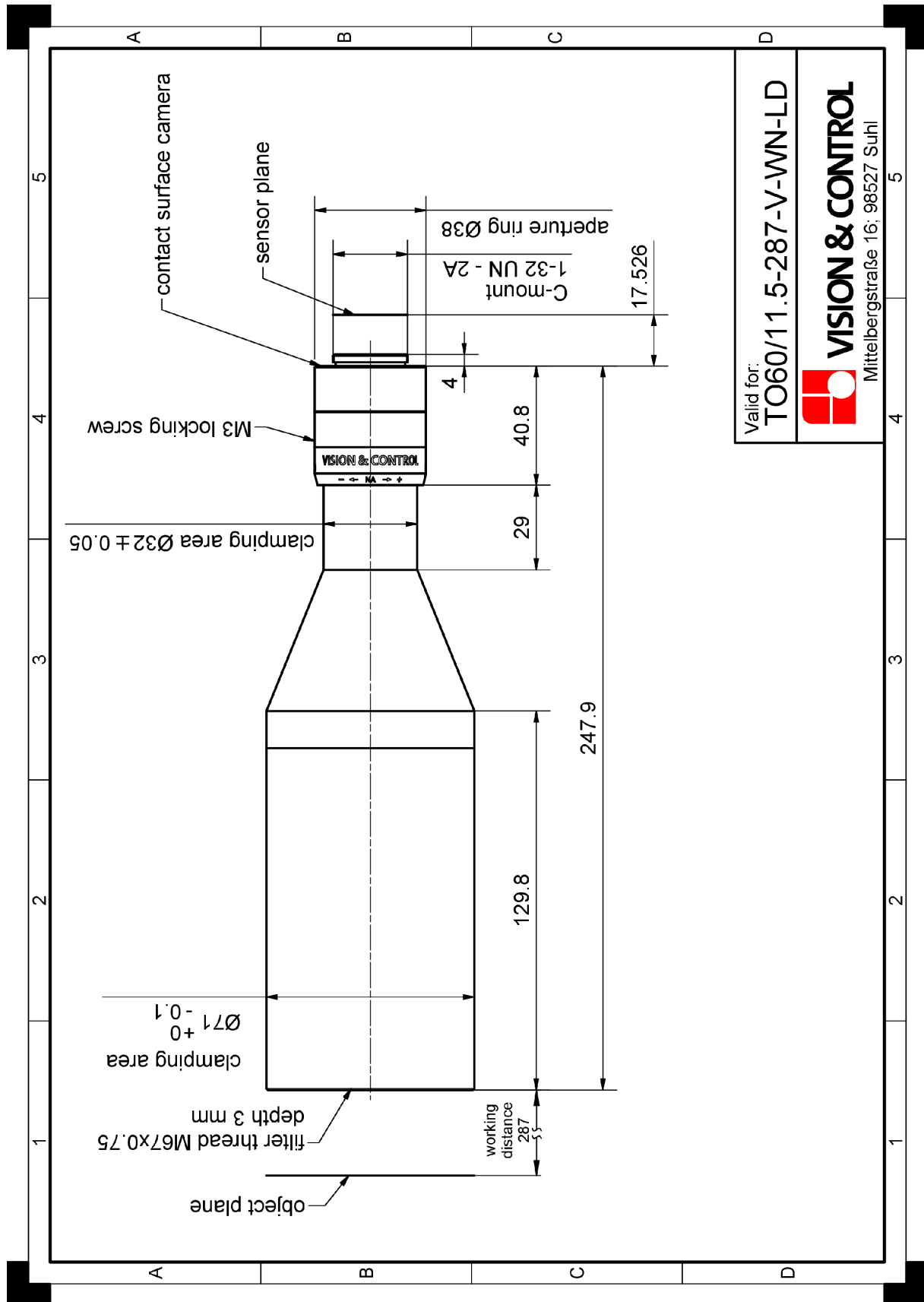
1 CHARACTERISTICS

- telecentric measuring objective with object-sided telecentric beam path
 - long working distance
 - designed for monochromatic applications
 - very well suited for blue LEDs including "deep blue" LEDs
 - high resolution, low telecentric error
 - adjustable aperture, lockable
 - robust industrial design
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2 TECHNICAL DATA

Image scale:	0.136 ± 2%
Depth image scale ($\Delta z' / \Delta z$)	0.018
Spectral range:	380 nm – 950 nm (monochromatic)
Working distance:	280 mm ± 3 mm
Camera distance (object-camera flange):	519.3 mm
Imaging length:	536.8 mm
Object field diagonal (max.):	60 mm
Sensor format (optimal):	1/2"
Image field diagonal (max.):	8.0 mm
Suitable for camera resolution:	8.5 MPixel
Recommended pixel size:	1.9 µm
Minimal object-side resolvable structure detail:	49 µm (@ 470 nm, F10)
Aperture:	F8 – F22
Depth of field:	56 mm (F10, 470 nm, MTF = 20 % @ 20 LP/mm)
Lens length:	239.3 mm
Lens diameter (max.):	71 mm
Lens mount:	C-Mount
Filter thread, object-side:	M67 x 0.75
Filter thread, camera-side:	M20.5 x 0.5
Weight:	1040 g
Usable object field with	
• 1/2" sensor (6.4 x 4.8 mm²):	47.1 mm x 35.3 mm
• 1/3" sensor (4.8 x 3.6 mm²):	35.3 mm x 26.5 mm
• 1/4" sensor (3.4 x 2.2 mm²):	25.0 mm x 16.2 mm

3 CUSTOMER DRAWING



4 EXTENSION RINGS

Extension rings mainly shorten the working distance. The magnification also changes, but only very slightly.

The working distance is reduced by approximately the thickness of the extension ring divided by the depth magnification.

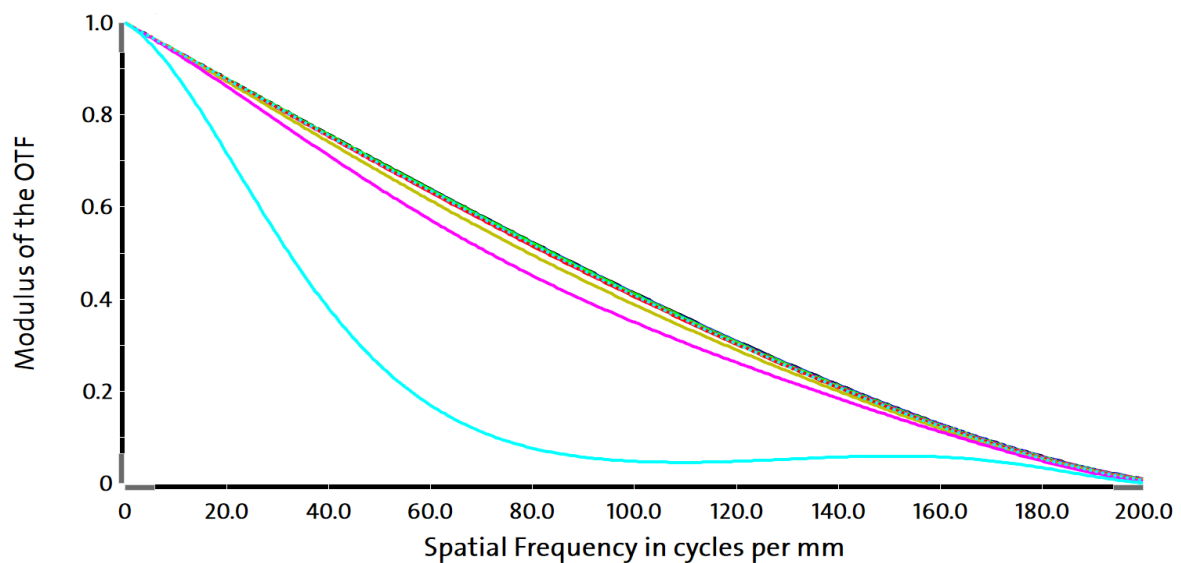
Extension rings can reduce the ideal imaging performance specified in the data sheet.

Parameter	Value
Working distance	280
Working distance with extension ring 0.1 mm	275
Working distance with extension ring 0.2 mm	269
Working distance with extension ring 0.5 mm	253
Working distance with extension ring 1 mm	226

5 OPTICAL CHARACTERISTICS (DESIGN DATA)

5.1 MONOCHROMATIC MTF IN THE IMAGE SPACE DEPENDING ON THE OBJECT FIELD HEIGHT

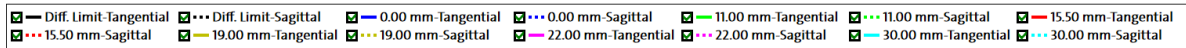
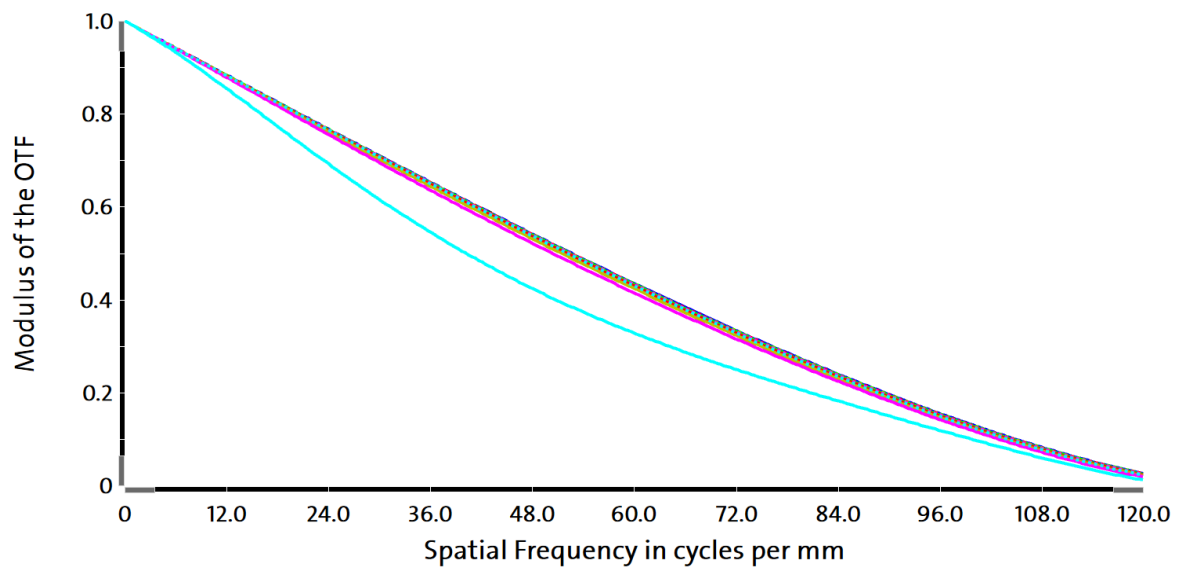
Wavelength: 470 nm



— Diff. Limit-Tangential	--- Diff. Limit-Sagittal	— 0.00 mm-Tangential	--- 0.00 mm-Sagittal	— 11.00 mm-Tangential	--- 11.00 mm-Sagittal	— 15.50 mm-Tangential	--- 15.50 mm-Sagittal
— 19.00 mm-Tangential	--- 19.00 mm-Sagittal	— 22.00 mm-Tangential	--- 22.00 mm-Sagittal	— 30.00 mm-Tangential	--- 30.00 mm-Sagittal		

Diffraction MTF

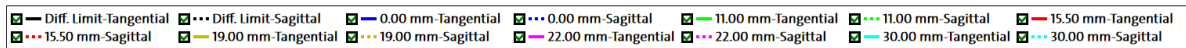
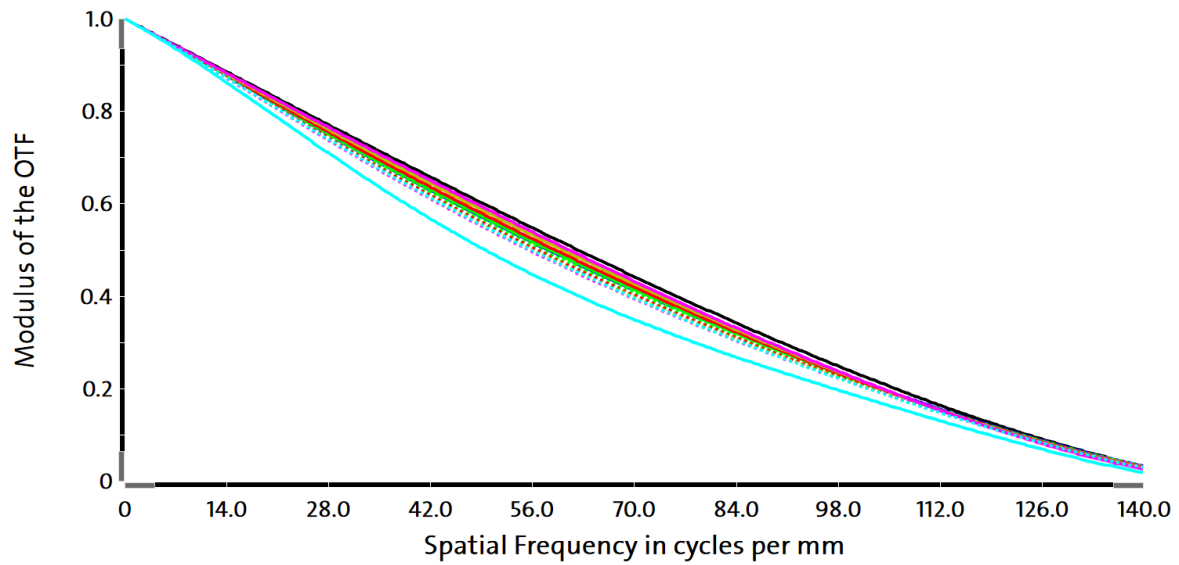
F-number: F10



Diffraction MTF

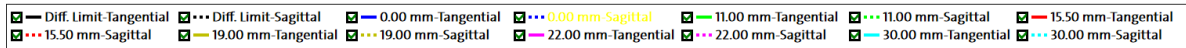
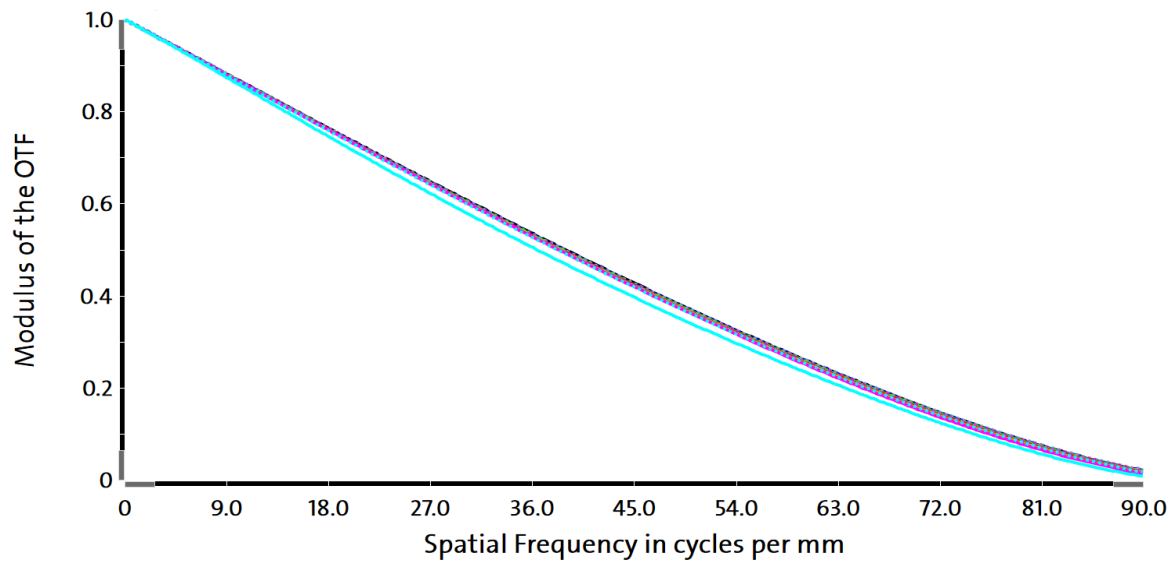
F-number: F16

Wavelength: 635 nm



Diffraction MTF

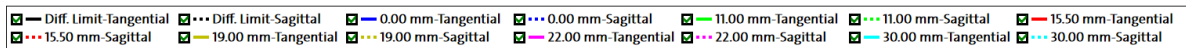
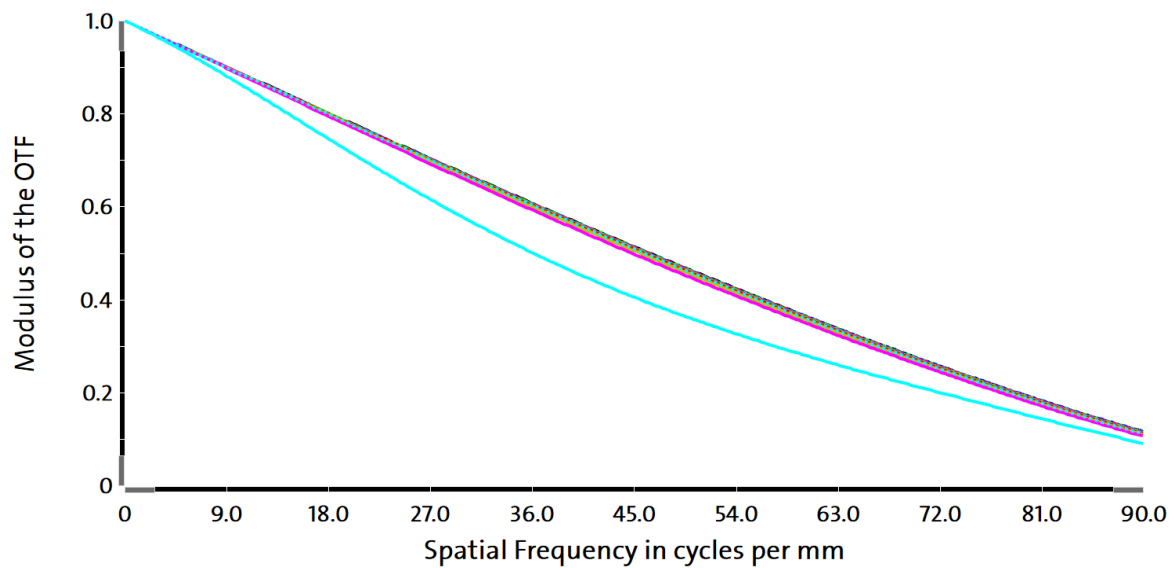
F-number: F10



Diffraction MTF

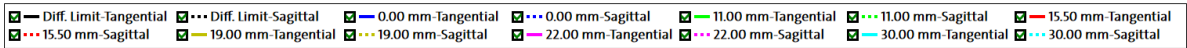
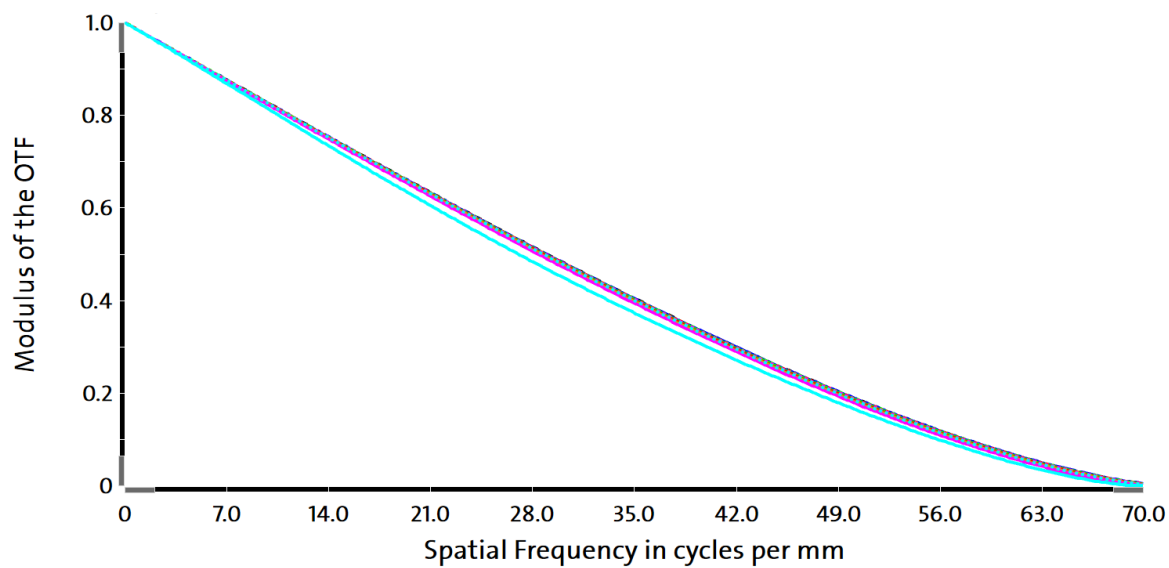
F-number: F16

Wavelength: 850 nm



Diffraction MTF

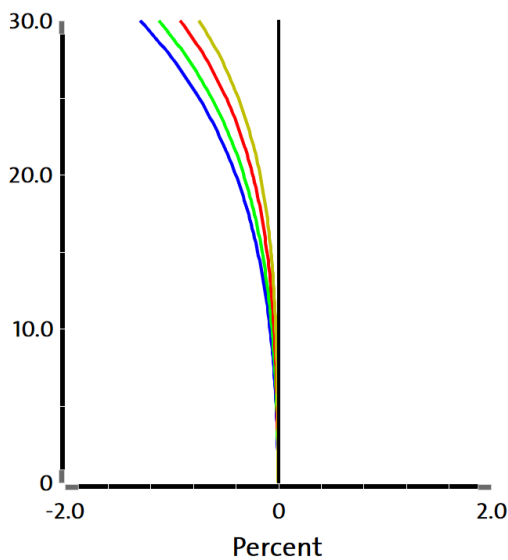
F-number: F10



Diffraction MTF

F-number: F16

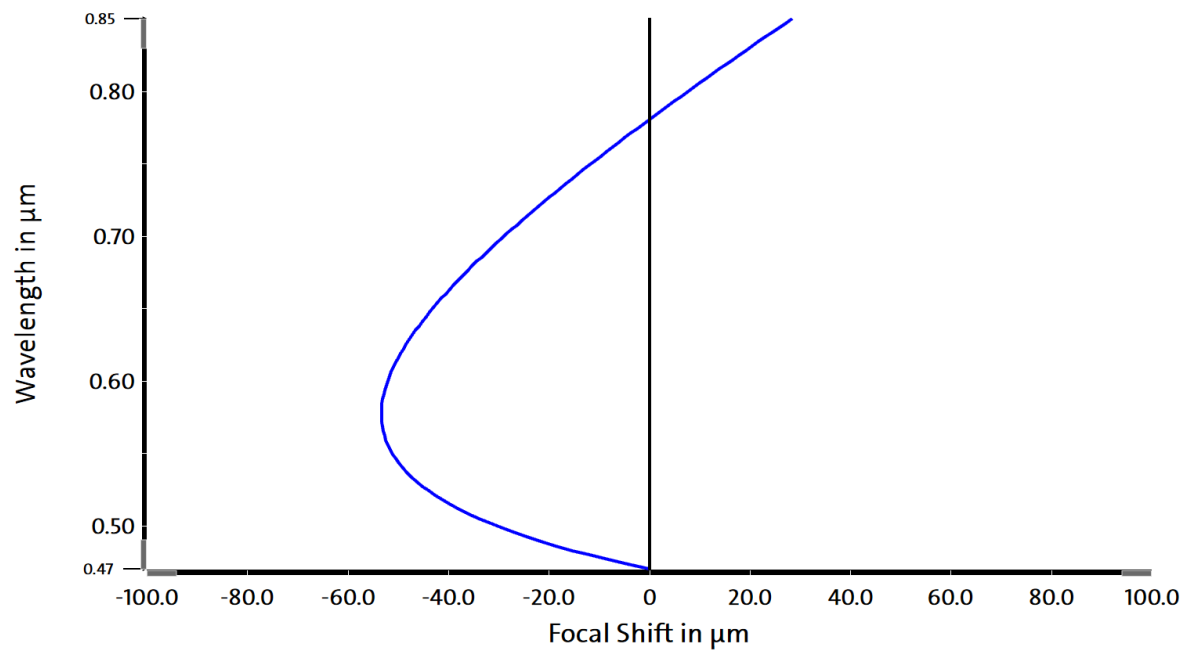
5.2 DISTORTION



F-Tan(Theta) Distortion	
07.04.2025 Maximum Field is 30.000 Millimeters. Maximum distortion = 1.2936%	Zemax
	Vision & Control

Distortion

5.3 FOCAL SHIFT



Chromatic Focal Shift	
07.04.2025 Maximum Focal Shift Range: 81.8502 μm Diffraction Limited Range: 193.100 μm Pupil Zone: 0.0000	Zemax
	Vision & Control

Focal shift