TCSE16M028VISNIR-F | DATASHEET

OPTO ENGINEERING

High-resolution telecentric lenses for 4/3", APS-C, APS-H and full frame sensors

KEY ADVANTAGES

Wide image circle for sensors up to 45.7 mm.

Excellent resolution and low distortion for accurate measurements.

Long working distance perfect for the inspection of electronic components.

Robust design ideal for industrial environments.

Detailed **test report** with **certified** optical parameters.

TCSE series features very high-resolution telecentric lenses designed for various large sensor formats up to full frame. TCSE lenses offer excellent optical performance ensuring unmatched resolution and low distortion.

SPECIFICATIONS

Optical specifications

Magnification		1.500
Image circle	(mm)	37.4
Max sensor size		2.4"
Working distance[1]	(mm)	212.2
Wavelegth range	(nm)	450-960
wf/N[2]		16-32
Telecentricity typical (max)[3]	(°)	<0.06 (0.08)
Distortion typical (max)[4]	(%)	<0.06 (0.08)
Field depth[5]	(mm)	0.37
Resolution (max)[6]	(µm)	7

Mechanical specifications

Mount[7]		F
Phase adjustment[8]		Yes
Length[9]	(mm)	356.1
Front diameter	(mm)	60.0
Mass	(g)	1479

ADDITIONAL NOTE

This lens works in VIS and IR wavelength range separately, changing working distance between the two configurations.

FIELD OF VIEW

Sensors	(mm x mm)
4/3" (15.29 x 15.30 mm x mm)	10.19 x 10.20
APS" (22.36 x 16.77 mm x mm)	14.91 x 11.18
CHR70M" (31.00 x 21.99 mm x mm)	20.67 x 14.66
CMV50000" (36.43 x 27.62 mm x mm)	$\oslash = 18.41$

[1] Working distance: distance between the front end of the mechanics and the object. Set this distance within $\pm 3\%$ of the nominal value for maximum resolution and minimum distortion.

[2] Working f/N: the real f/N of a lens in operating conditions.

[3] Maximum angle between chief rays and optical axis on the object side. Typical (average production) values and maximum (guaranteed) values are listed.

[4] Percent deviation of the real image compared to an ideal, undistorted image. Typical (average production) values and maximum (guaranteed) values are listed.

[5] At the borders of the field depth the image can be still used for measurement but, to get a very sharp image, only half of the nominal field depth should be considered. Pixel size used for calculation is 3.45 µm.

[6] Object side, calculated with the Rayleigh criterion with λ= 520 nm

[7] FD stands for Flange Distance (in mm), defined as the distance from the mounting flange to the camera detector plane.

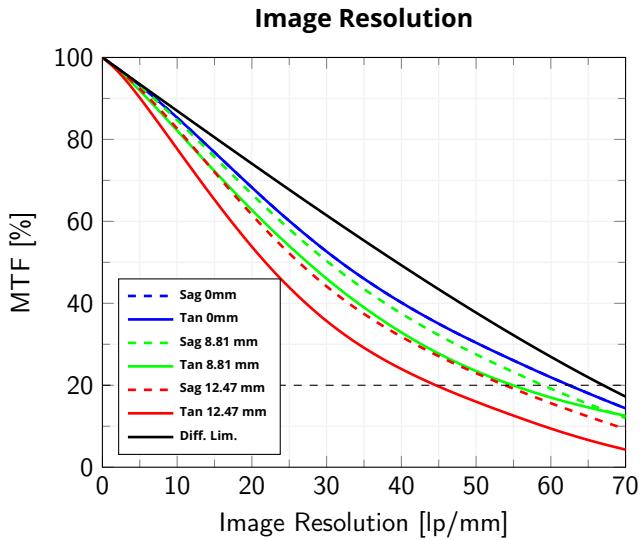[8] Indicates the availability of an integrated camera phase adjustment feature.

[9] Measured from the front end of the mechanics to the camera flange.
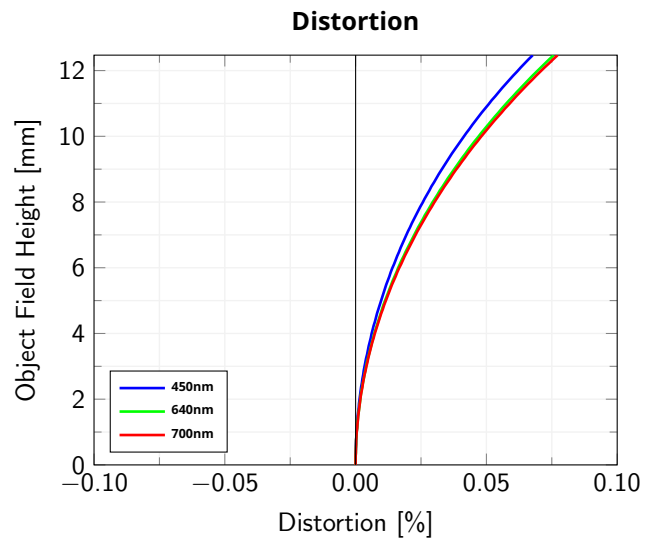
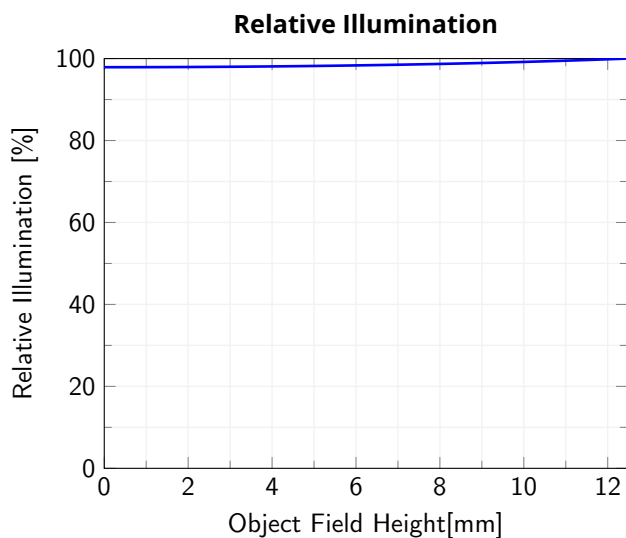## COMPATIBLE PRODUCTS

Full list of compatible products available *here*.

OPTICS	LIGHTING	CAMERAS	SOFTWARE	ACCESSORIES

A wide selection of innovative machine vision components.
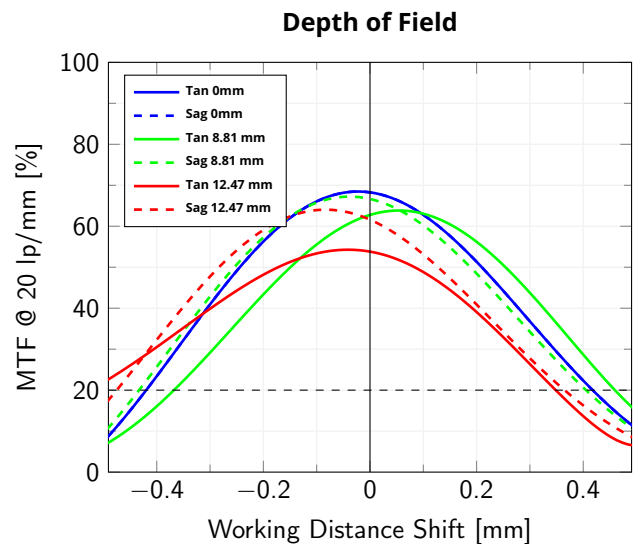
Image Resolution

Modulation Transfer Function (MTF) vs. Image Resolution, wavelength range 450-700 nm, wf/N = 16

Distortion

Object Field Height vs. Distortion, from the optical axis to the corner of the field of view, wf/N = 16
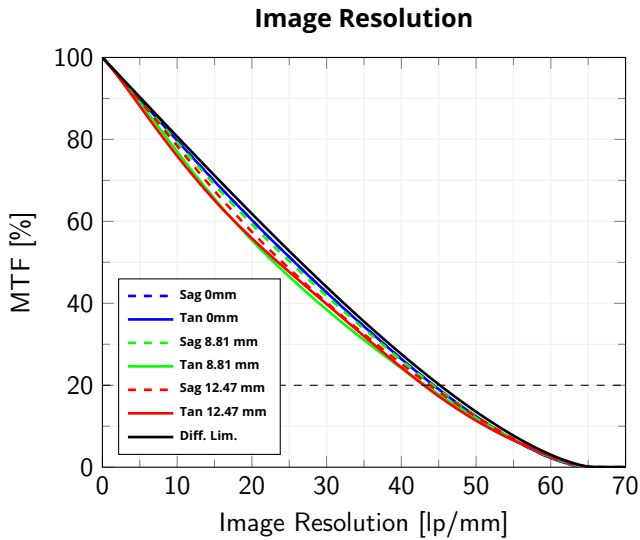
Relative Illumination

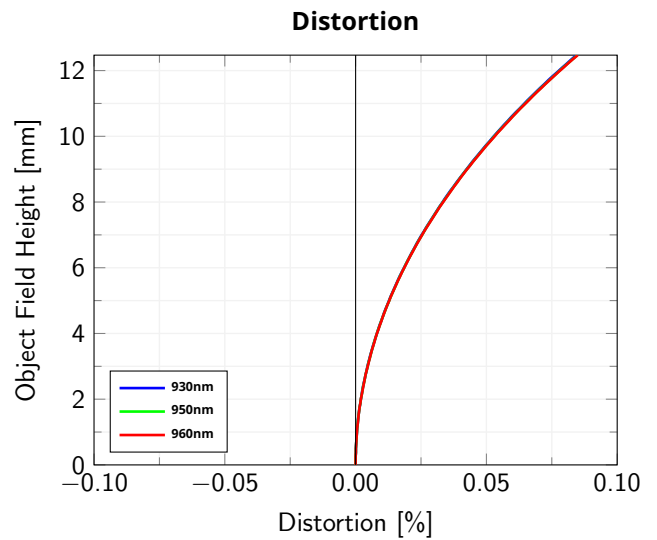Relative illumination vs. Object Field Height, from the optical axis to the corner of the field of view, wf/N = 16

Depth of Field

Modulation Transfer Function (MTF) @ 20 lp/mm vs. Working Distance Shift from the best focus Working Distance, wavelength range 450-700 nm, wf/N = 16
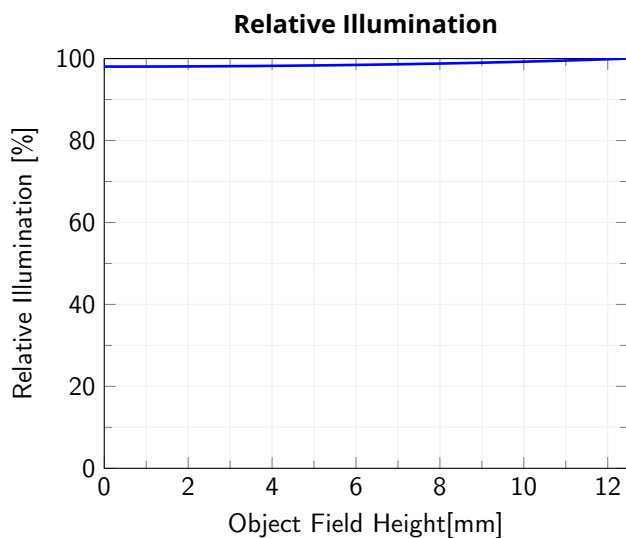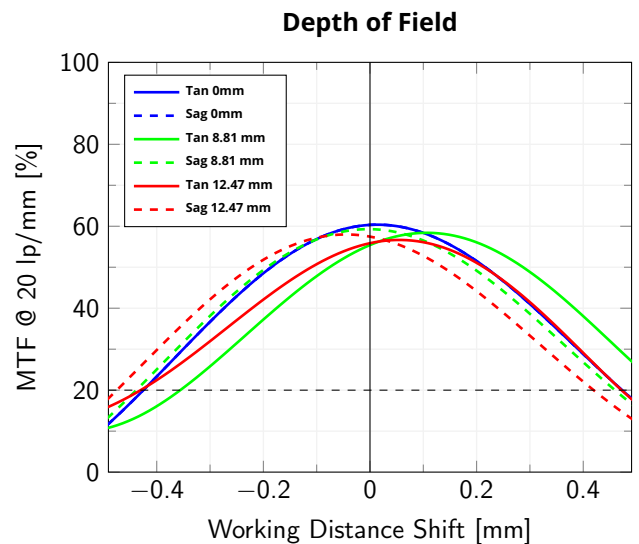
Image Resolution

Modulation Transfer Function (MTF) vs. Image Resolution, wavelength range 930-960 nm, wf/N = 16

Distortion

Object Field Height vs. Distortion, from the optical axis to the corner of the field of view, wf/N = 16

Relative Illumination

Relative illumination vs. Object Field Height, from the optical axis to the corner of the field of view, wf/N = 16

Depth of Field

Modulation Transfer Function (MTF) @ 20 lp/mm vs. Working Distance Shift from the best focus Working Distance, wavelength range 930-960 nm, wf/N = 16