

High resolution telecentric lens, magnification 0.156x, WD 396.0 mm, F mount



## KEY ADVANTAGES

**Wide image circle** suitable for sensors up to APS-C.

**Excellent resolution and low distortion.**

**Simple and robust design** for industrial environments.

Detailed [test report](#) with [certified optical parameters](#).

**TC10M series** features high resolution telecentric optics with an image circle of 28 mm that perfectly fit cameras with large sensors, up to APS-C format.

## SPECIFICATIONS

### Optical specifications

Magnification		0.156
Image circle	(mm)	28.0
Max sensor size		APS-C
Working distance <sup>2</sup>	(mm)	396.0
$wf/N$ <sup>3</sup>		8
Telecentricity typical (max) <sup>4</sup>	(°)	<0.06 (0.10)
Distortion typical (max) <sup>5</sup>	(%)	<0.08 (0.10)
Field depth <sup>6</sup>	(mm)	27.1
Resolution (max) <sup>7</sup>	( $\mu$ m)	33

### Mechanical specifications

Mount <sup>8</sup>		F
Phase adjustment <sup>9</sup>		Yes
Length <sup>10</sup>	(mm)	506.9
Front diameter	(mm)	200.0
Mass	(g)	6022

## FIELD OF VIEW

Sensors	(mm x mm)
4/3" IMX387 (18.87 x 10.64 mm x mm)	120.96 x 68.21
4/3" IMX367 (15.29 x 15.30 mm x mm)	98.01 x 98.08
Line 4k x 7 $\mu$ m (28.67 mm) <sup>1</sup>	183.78
APS-C IMX342 (22.36 x 16.77 mm x mm)	143.33 x 107.50

<sup>1</sup> With Line 4k-7 $\mu$ m (28.67 mm diagonal) sensors, the FOV may show some vignetting at the image corners.

<sup>2</sup> 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.

<sup>3</sup> working  $f/N$ : the real  $f/N$  of a lens in operating conditions.

<sup>4</sup> Maximum angle between chief rays and optical axis on the object side. Typical (average production) values and maximum (guaranteed) values are listed.

<sup>5</sup> Percent deviation of the real image compared to an ideal, undistorted image. Typical (average production) values and maximum (guaranteed) values are listed.

<sup>6</sup> 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 5.5  $\mu$ m.

<sup>7</sup> Object side, calculated with the Rayleigh criterion with  $\lambda = 520$  nm

<sup>8</sup> FD stands for Flange distance (in mm), defined as the distance from the mounting flange to the camera detector plane.

<sup>9</sup> Indicates the availability of an integrated camera phase adjustment feature.

<sup>10</sup> Measured from the front end of the mechanics to the camera flange.

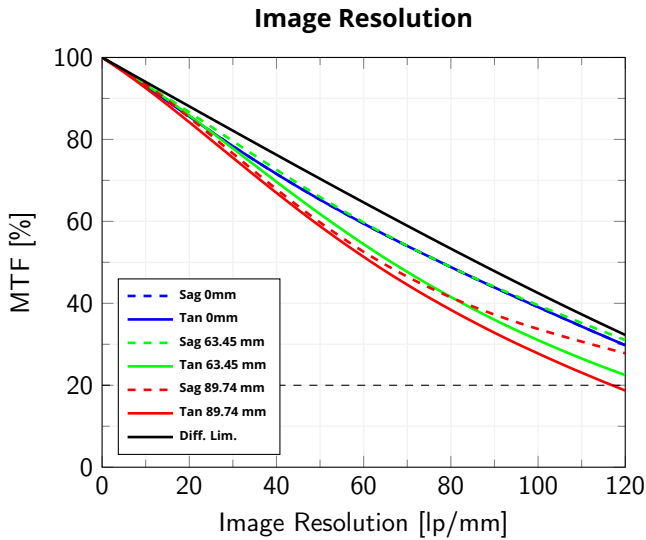
## COMPATIBLE PRODUCTS

Full list of compatible products available [here](#).

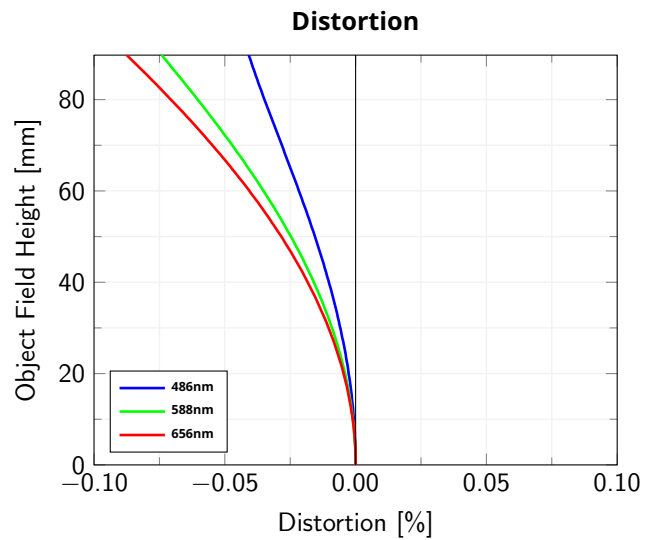


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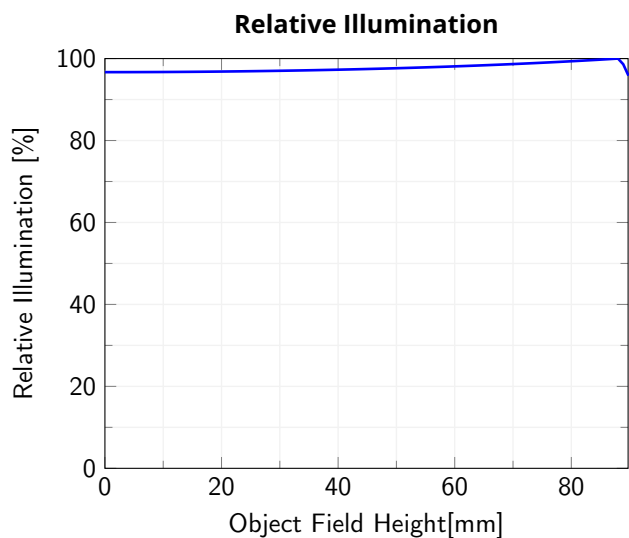
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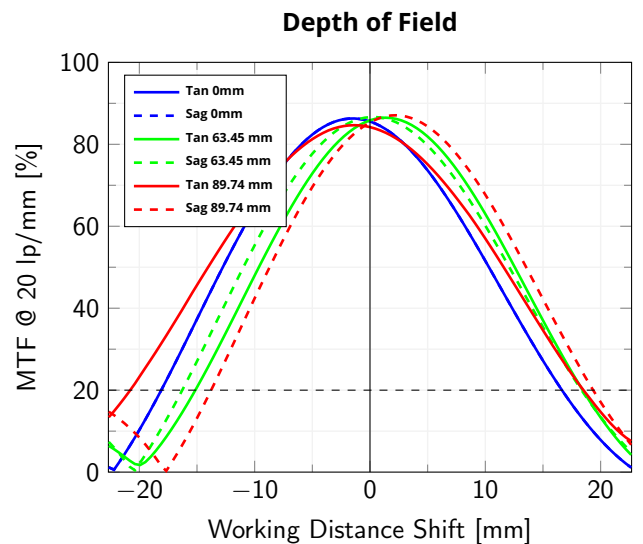
Modulation Transfer Function (MTF) vs. Image Resolution, wavelength range 486 nm - 656 nm



Object Field Height vs. Distortion, from the optical axis to the corner of the field of view



Relative illumination vs. Object Field Height, from the optical axis to the corner of the field of view



Modulation Transfer Function (MTF) @ 20 lp/mm vs. Working Distance Shift from the best focus Working Distance, wavelength range 486 nm - 656 nm

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