

## Telecentric optical bench, magnification 0.093x



### SPECIFICATIONS

#### Optical specifications

Magnification		0.093
Image circle	(mm)	11.0
Max sensor size		2/3"
Working distance <sup>1</sup>	(mm)	278.6
wF/N <sup>2</sup>		8
Telecentricity typical (max) <sup>3</sup>	(°)	< 0.06 (0.08)
Distortion typical (max) <sup>4</sup>	(%)	< 0.04 (0.08)
Field depth <sup>5</sup>	(mm)	47.9
Resolution (max) <sup>6</sup>	(µm)	55

#### Electrical specifications

Light color, peak wavelength		green, 520 nm
Supply Voltage	(V)	12-24
Max power consumption	(W)	2.5
LED forward voltage typ.(max) <sup>7</sup>	(V)	3.3 (4.0)
Max LED forward current <sup>8</sup>	(mA)	350
Max LED pulse Current <sup>9</sup>	(mA)	2000

#### Mechanical specifications

Mount		C
Phase adjustment		No
Length <sup>10</sup>	(mm)	1084.0
Width	(mm)	185.0
Height	(mm)	207.0
Mass	(g)	15350

### KEY ADVANTAGES

#### Pre-assembled set-up

Just attach your camera, and the bench is ready for measurement

#### Best optical performances

The bench is pre-set to provide unpaired measurement accuracy

#### Tested system

The bench is quality tested as a whole system

#### Detailed test report with measured optical parameters.

**TCBENCH series** are complete optical systems designed for hassle-free development of demanding measurement applications.

#### Environment

Operating temperature	(°C)	0-40
Storage temperature	(°C)	0-50
Operating relative humidity	(%)	20-85, non condensing
Installation		Indoor use only

#### Eye safety

Risk group (CEI EN 62471:2010)	Risk group 1
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<sup>1</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>2</sup> working  $f/N$ : the real  $f/N$  of a lens in operating conditions.

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

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

<sup>5</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 3.45 µm.

<sup>6</sup> Object side, calculated with the Rayleigh criterion with  $\lambda = 520$  nm

<sup>7</sup> Used in continuous (not pulsed) mode.

<sup>8</sup> At max forward current. Tolerance is  $\pm 0.06$ V on forward voltage measurements.

<sup>9</sup> At pulse width  $\leq 10$  ms, duty cycle  $\leq 10\%$  condition. Built-in electronics board must be bypassed (see tech info).

<sup>10</sup> Measured from the camera flange of the objective lens to the electronic end of the illuminator. Cable, connector and mount thread excluded.

### FIELD OF VIEW

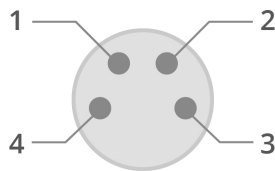
Sensors	(mm x mm)
1/3" (4.8 x 3.6 mm x mm)	51.61 x 38.71
1/2.5" (5.70 x 4.28 mm x mm)	61.29 x 46.02
1/2" (6.4 x 4.8 mm x mm)	68.82 x 51.61
1/1.8" (7.13 x 5.33 mm x mm)	76.67 x 57.31
2/3" (8.50 x 7.09 mm x mm)	91.40 x 76.24

### INCLUDED IN TCBENCH

Each kit contains:

- 1 bi-telecentric lens for 2/3" detectors
- 1 LTCLHP telecentric illuminator (green)
- 2 CMHO mechanical clamps
- 1 CMPT base-plate
- 1 PTTC chrome-on-glass calibration pattern
- 1 CMPH pattern holder

### CONNECTOR PINOUT



Device side

### COMPATIBLE PRODUCTS

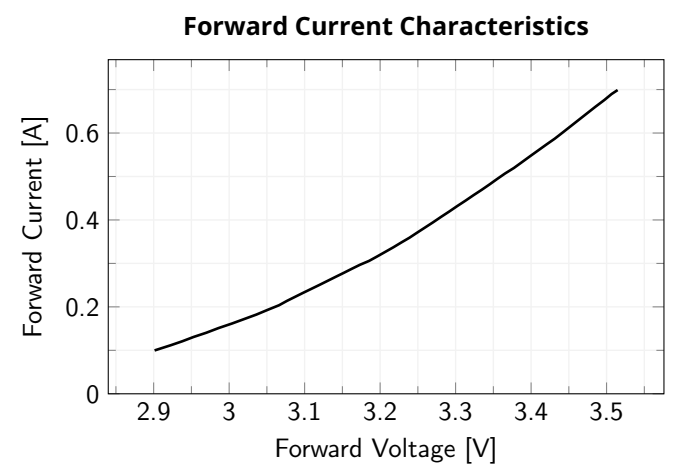
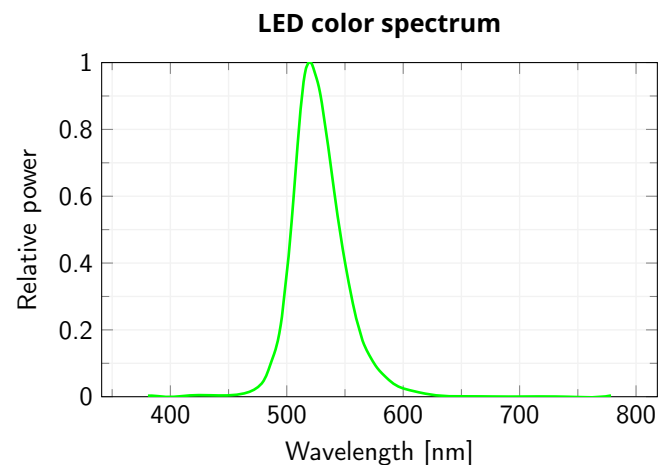
Full list of compatible products available [here](#).



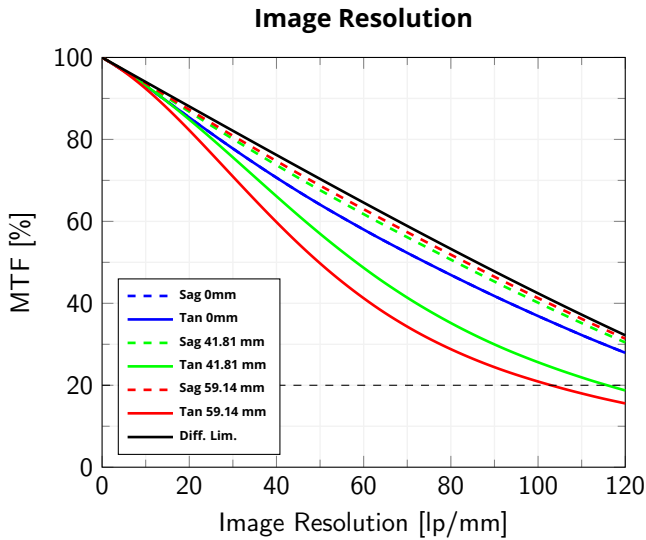
A wide selection of innovative machine vision components.

Pin	Function	Cable color
1	Earth	Yellow/green
2	Ground	Black
3	LED anode	Blue
4	Power supply (+12/24 V)	Brown

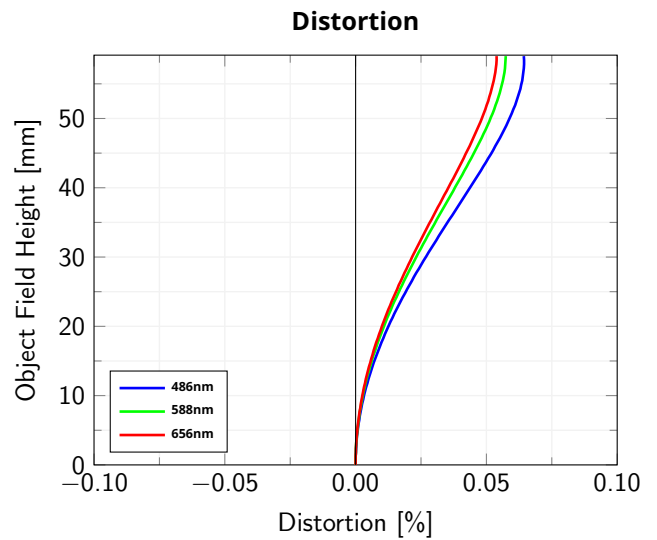
### ADDITIONAL INFORMATION



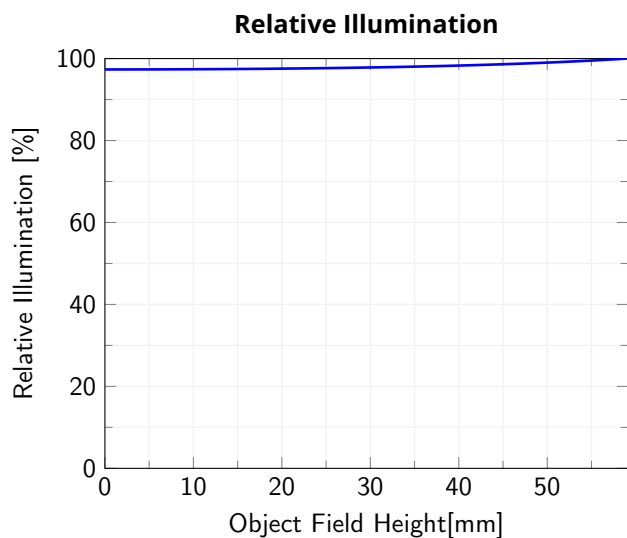
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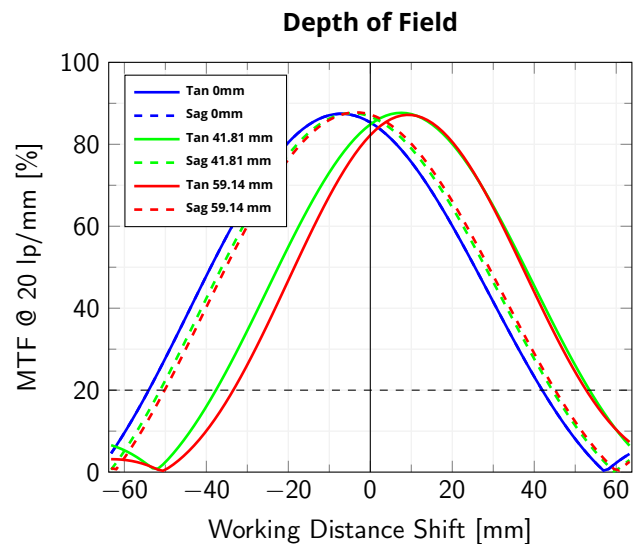
Modulation Transfer Function (MTF) vs. Image Resolution, wavelength range 486 nm - 656 nm



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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