TOURMALINE 2.8/50 C-MI

This high resolution 1.3" C-Mount lens with motorized iris is compact and robust and therefore ideal for demanding imaging applications even in harsh environment. The optical design prevents shading with CRA sensitive sensors and the special broadband AR coating enables the use either in the visible 400 to 700 nm or in the NIR 700 to 1000 nm range.

Key features

- Compact and robust design
- Motorized iris (P-iris)
- Image circle 24 mm
- Low chief ray angle

Applications

- Machine Vision
- AOI (Automated Optical Inspection)
- 3D and 2D measurement
- Traffic and surveillance

Technical specifications

Type [motorized iris]	C-MI
ID [motorized iris]	1076168
Interface	C-Mount
Focal length [mm]	50
F/# range	F/2.8 ... F/32
Numerical aperture [object | image]	- | 0.17
Max. sensor size [mm]	24
Max. angle of view [°]	27
Rec. magnification range	-0.5 ... 0
Rec. working distance range [mm]	131 ... ∞
Min. working distance without extension tubes [mm]	366
Filter thread [mm]	M30.5 x 0.5
Storage temperature [°C]	-25 … +70
Net. weight [standard] [g]	179
Additional info	-
f'eff [mm]	50.15
SF [mm]	-33.61
S'F' [mm]	31.68
HH' [mm]	-3.07
ß'P	0.94
SEP [mm]	19.56
S'AP [mm]	-15.61
Σd [mm]	31.93

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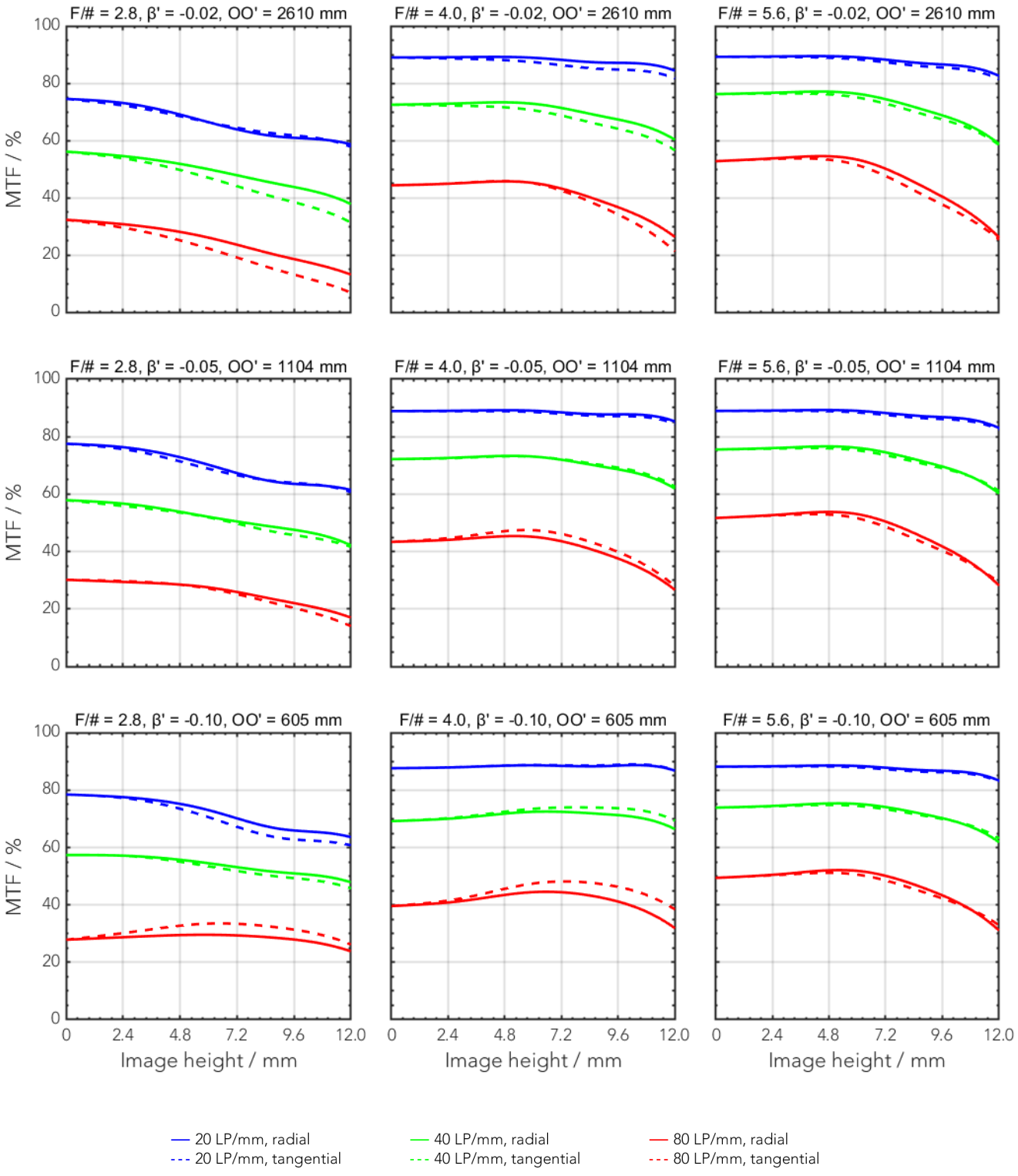
TOURMALINE 2.8/50 C-MI

MTF charts

Spectrum name	VIS					
Wavelengths [nm]	425	475	525	575	625	675
Rel. weights [%]	8	16	23	22	19	13



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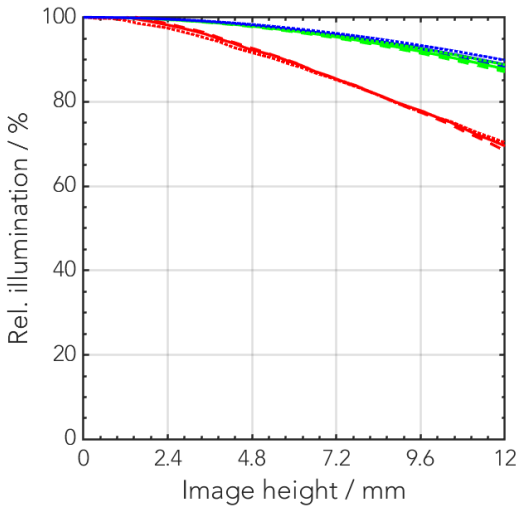
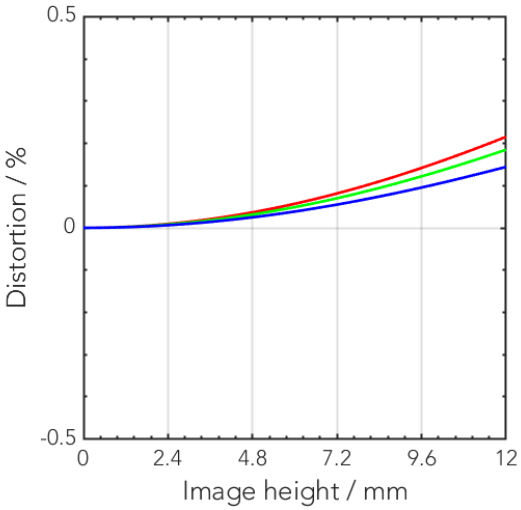
TOURMALINE 2.8/50 C-MI

Rel. illumination vs. image height



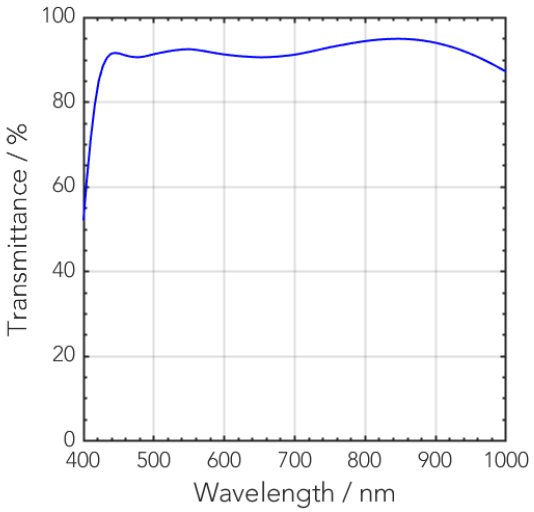
F/# = 2.8, β = -0.02
F/# = 5.6, β = -0.02
F/# = 8.0, β = -0.02
F/# = 2.8, β = -0.05
F/# = 5.6, β = -0.05
F/# = 8.0, β = -0.05
F/# = 2.8, β = -0.10
F/# = 5.6, β = -0.10
F/# = 8.0, β = -0.10

Distortion vs. image height



β ' = -0.02
β ' = -0.05
β ' = -0.10

Transmittance vs. wavelength



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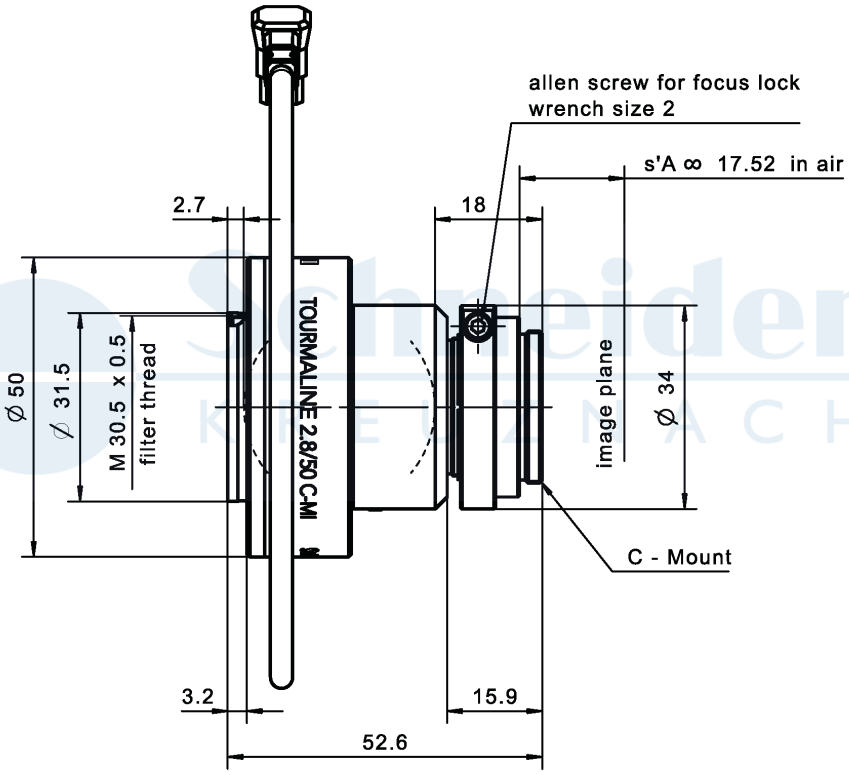
Technical drawings



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TOURMALINE 2.8/50 C-MI

Additional electrical information

Motor type	2 phase, bipolar stepper motor
Coil resistance	21 Ohm
Current	≤ 143 mA/Phase
Max. voltage	5 V
Coil inductivity	1.8 mH/phase @ 1 kHz
Max. step frequency	400 Hz
Cable type	Lemo Santoprene 2 x 2 x 0.14 mm² black
Cable length	300 mm
Electrical connector	JEITA E4-191J-100
Operating temperature	0°C to +50°C
Storage temperature	-25°C to +70°C
Mean time between failures (MTBF)	> 100.000 cycles

Sequenze of excitation

pins \ steps	1	2	3	4
3	high	high	low	low
2	low	low	high	high
1	low	high	high	low
4	high	low	low	high
Iris movement	<--- open iris / ---> close iris			

Motor steps to f-stop resolution

Motor steps	5	10	15	20	25	30	35	40
Iris-diameter	10.9	7.9	5.7	4.2	3.1	2.2	1.6	1.2
F-Stop	3	4.1	5.7	7.8	10.8	14.8	20.5	28.2

F-stop to motor steps resolution

F-stop	2.8	4	5.6	8	11	16	22	32
Iris-diameter	11.7	8.2	5.8	4.1	3	2	1.5	1
Motor steps	3.9	9.5	14.8	20.3	25.3	31.2	36.1	42

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Accessories	Mount	Eff. length	ID
Adapter	CS-Mount	5 mm	25081
	C-Mount / M42 x 1	5.5 mm	1075817
Extension tube	C-Mount / C-Mount	5 mm	39316
	C-Mount / C-Mount	8 mm	39315
	C-Mount / C-Mount	10 mm	39312

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Annotation	
Focal length	Nominal focal length
F/# range	Image space F-number range for infinity focus position
Numerical aperture	Maximum real numerical aperture (depending on recommended magnification range either for infinity or respective fixed magnification)
Max. sensor size	Image circle diameter
Max. angle of view	Angle of view associated with maximum sensor size (depending on recommended magnification range either for infinity or respective fixed magnification)
Rec. magnification range	Magnification range as recommended by Schneider-Kreuznach
Rec. working distance range	Working distance, i.e. distance between object and first mechanical element, associated with recommended magnification range
Max. mechanical focus travel	Maximum possible movement of the lens from infinity position (depending on recommended magnification range either for infinity or respective fixed magnification)
Net weight	weight of unpacked lens without lens cap
f'eff	Effective focal length
SF	Distance between vertex of first lens surface and object space focal point
S'F'	Distance between vertex of last lens surface and image space focal point (back focal distance at infinity)
HH'	Distance between principal planes
ß'P	Pupil magnification (= exit pupil diameter / entrance pupil diameter)
SEP	Distance between vertex of first lens surface and entrance pupil
S'AP	Distance between vertex of last lens surface and exit pupil
Σ d	Distance between vertices of first and last lens surface
s'A	Flange focal distance (in air) for infinite object distance (depending on recommended magnification range either for infinity or respective fixed magnification)
ß'	Magnification (= image size / object size), negative value because image is inverted
OO'	Distance between object and image

Unless otherwise stated all dimensions in this data sheet are in mm.

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