

Contour Elite Objectives



Turret Mountable, Standard Objective Series (parfocal with each other)

Objective (Magnification ¹)	2.5X		5X / 5XL		10XBF		10X		20X		50X		115X	
Working Distance (mm)	3.5		6.7 / 9.4		10.6		7.4		4.7		3.4		0.6	
Numerical Aperture	0.07		0.12 / 0.13		0.25		0.3		0.4		0.55		0.8	
Max Slope on Shiny Surfaces (deg) ²	3		5.5 / 5.9		N/A		14.0		18.9		26.7		41.5	
Max Slope on Rough Surfaces (deg) ³	62		65 / 65		N/A		70		72		81		87	
Optical Resolution (μm) ⁴	3.8		2.2 / 2.1		1.1		0.9		0.7		0.5		0.33	
Tallest Sample: Elite X (mm)	101.6		101.6 / 101.6		101.6		101.6		101.6		101.6		101.6	
Tallest Sample: Elite I, K (mm)	95.3		95.3 / 95.3		95.3		95.3		95.3		95.3		95.3	
Sq Repeatability (nm) ⁵	0.01		0.01 / 0.01		0.01		0.01		0.01		0.01		0.01	
	FOV X by Y (mm)	Spatial Sampling (μm)	FOV X by Y (mm)	Spatial Sampling (μm)	FOV X by Y (mm)	Spatial Sampling (μm)	FOV X by Y (mm)	Spatial Sampling (μm)	FOV X by Y (mm)	Spatial Sampling (μm)	FOV X by Y (mm)	Spatial Sampling (μm)	FOV X by Y (mm)	Spatial Sampling (μm)
Standard Camera: (Elite K, I, X)														
0.55x Zoom	4.6x3.5	7.2	2.3x1.7	3.6	1.2x0.9	1.8	1.2x0.9	1.8	0.6x0.4	0.9	0.23x0.17	0.36	0.14x0.08	0.16
0.75x Zoom	3.4x2.5	5.3	1.7x1.3	2.6	0.8x0.6	1.3	0.8x0.6	1.3	0.4x0.3	0.7	0.17x0.13	0.26	0.07x0.06	0.11
1.0x Zoom	2.5x1.9	4.0	1.3x1.0	2.0	0.6x0.5	1.0	0.6x0.5	1.0	0.3x0.2	0.5	0.13x0.10	0.20	0.06x0.04	0.09
1.5x Zoom	1.7x1.3	2.6	0.8x0.6	1.3	0.4x0.3	0.7	0.4x0.3	0.7	0.2x0.2	0.3	0.08x0.06	0.13	0.04x0.03	0.06
2.0x Zoom	1.3x1.0	2.0	0.6x0.5	1.0	0.3x0.2	0.5	0.3x0.2	0.5	0.2x0.1	0.2	0.06x0.05	0.10	0.03x0.02	0.04
High-Resolution Camera: Elite X														
0.55x Zoom	6.4x4.8	4.7	3.2x2.4	2.3	1.6x1.2	1.2	1.6x1.2	1.2	0.8x0.6	0.6	0.32x0.24	0.23	0.14x0.14	0.14
0.75x Zoom	4.7x3.5	3.4	2.4x1.8	1.7	1.2x0.9	0.9	1.2x0.9	0.9	0.6x0.4	0.4	0.24x0.18	0.17	0.10x0.10	0.10
1.0x Zoom	3.5x2.6	2.6	1.8x1.3	1.3	0.9x0.7	0.6	0.9x0.7	0.6	0.4x0.3	0.3	0.18x0.13	0.13	0.08x0.06	0.06
1.5x Zoom	2.4x1.8	1.7	1.2x0.9	0.9	0.6x0.4	0.4	0.6x0.4	0.4	0.3x0.2	0.2	0.12x0.09	0.09	0.05x0.04	0.04
2.0x Zoom	1.8x1.3	1.3	0.9x0.7	0.6	0.4x0.3	0.3	0.4x0.3	0.3	0.2x0.2	0.2	0.09x0.07	0.06	0.04x0.03	0.03
High-Resolution Camera: Elite K, I														
0.55x Zoom	3.5x2.6	2.7	1.8x1.3	1.4	0.9x0.7	0.7	0.9x0.7	0.7	0.6x0.3	0.3	0.24x0.18	0.15	0.07x0.05	0.05
0.75x Zoom	2.6x1.9	2.0	1.3x1.0	1.0	0.7x0.5	0.5	0.7x0.5	0.5	0.4x0.2	0.3	0.17x0.13	0.11	0.05x0.04	0.04
1.0x Zoom	1.9x1.5	1.5	1.0x0.7	0.8	0.5x0.4	0.4	0.5x0.4	0.4	0.3x0.2	0.2	0.13x0.10	0.08	0.04x0.03	0.03
1.5x Zoom	1.3x1.0	1.0	0.6x0.5	0.5	0.3x0.2	0.3	0.3x0.2	0.3	0.2x0.1	0.1	0.09x0.07	0.05	0.03x0.02	0.02
2.0x Zoom	1.0x0.7	0.8	0.5x0.4	0.4	0.2x0.2	0.2	0.2x0.2	0.2	0.2x0.1	0.1	0.07x0.05	0.04	0.02x0.02	0.02

Non-Turret Mountable Objectives

	LWD Objectives (parfocal with each other)						Through Transmissive Media Objectives (parafoval with each other)						Low Magnification Objectives			
Magnification ¹	2X		5X		10X		2X		5X		10X		20X		1.0X	1.5X
Working Distance (mm)	22		22		22		8.0-9.8 ⁶		8.0-9.8 ⁶		8.0-9.8 ⁶		8.0-9.8 ⁶		2.5	9.6
Numerical Aperture	0.055		0.14		0.17		0.055		0.14		0.25		0.28		0.04	0.04
Max Slope on Shiny Surfaces (deg) ²	2.5		6.4		11.6		2.5		6.4		11.6		13.0		1.8	1.9
Optical Resolution (µm) ⁴	4.9		1.9		1.6		4.9		1.9		1.1		1.0		6.7	6.5
Tallest Sample: Elite X (mm)	66.8		66.8		66.8		70.9		70.9		70.9		70.9		60.7	60.7
Tallest Sample: Elite I, K (mm)	60.5		60.5		60.5		64.5		64.5		64.5		64.5		54.4	54.4
Sq Repeatability (nm) ⁵	0.01		0.01		0.01		0.01		0.01		0.01		0.01		0.01	0.01
	FOV X by Y (mm)	Spatial Sampling (µm)	FOV X by Y (mm)	Spatial Sampling (µm)	FOV X by Y (mm)	Spatial Sampling (µm)	FOV X by Y (mm)	Spatial Sampling (µm)	FOV X by Y (mm)	Spatial Sampling (µm)	FOV X by Y (mm)	Spatial Sampling (µm)	FOV X by Y (mm)	Spatial Sampling (µm)	FOV X by Y (mm)	Spatial Sampling (µm)
Standard Camera: Elite K, I, X																
0.55x Zoom	5.8x4.3	9.0	2.3x1.7	3.6	1.2x0.9	1.8	5.8x4.3	9.0	2.3x1.7	3.6	1.2x0.9	1.8	0.6x0.4	0.9	11.5x8.7	18.0
0.75x Zoom	4.2x3.2	6.6	1.7x1.3	2.6	0.8x0.6	1.3	4.2x3.2	6.6	1.7x1.3	2.6	0.8x0.6	1.3	0.4x0.3	0.7	8.4x6.4	13.2
1.0x Zoom	3.2x2.4	4.95	1.3x1.0	1.98	0.6x0.5	0.99	3.2x2.4	4.95	1.3x1.0	2.0	0.6x0.5	1.0	0.3x0.2	0.5	6.3x4.8	9.9
1.5x Zoom	2.1x1.6	3.3	0.8x0.6	1.3	0.4x0.3	0.7	2.1x1.6	3.3	0.8x0.6	1.3	0.4x0.3	0.7	0.2x0.2	0.3	4.2x3.2	6.6
2.0x Zoom	1.6x1.2	2.5	0.6x0.5	1.0	0.3x0.2	0.5	1.6x1.2	2.5	0.6x0.5	1.0	0.3x0.2	0.5	0.2x0.1	0.2	3.2x2.4	5.0
High-Resolution Camera: Elite X																
0.55x Zoom	6.4x4.8	5.9	3.2x2.4	2.3	3.2x2.4	1.2	1.6x1.2	5.9	1.6x1.2	2.3	0.8x0.6	1.2	0.3x0.2	0.5	16.0x12.0 ⁷	11.7
0.75x Zoom	4.7x3.5	4.3	2.4x1.8	1.7	2.4x1.8	0.9	1.2x0.9	4.3	1.2x0.9	1.7	0.6x0.4	0.9	0.2x0.2	0.4	11.8x8.8	8.6
1.0x Zoom	3.5x2.6	3.23	1.8x1.3	1.3	1.8x1.3	0.6	0.9x0.7	3.2	0.9x0.7	1.3	0.4x0.3	0.6	0.2x0.1	0.3	8.82x6.6	6.45
1.5x Zoom	2.4x1.8	2.2	1.2x0.9	0.9	1.2x0.9	0.4	0.6x0.4	2.2	0.6x0.4	0.9	0.3x0.2	0.4	0.1x0.1	0.2	5.9x4.4	4.3
2.0x Zoom	1.8x1.3	1.6	0.9x0.7	0.6	0.9x0.7	0.3	0.4x0.3	1.6	0.4x0.3	0.6	0.2x0.2	0.3	0.1x0.1	0.2	4.4x3.3	3.2
High-Resolution Camera: Elite K, I																
0.55x Zoom	4.4x3.3	3.4	1.8x1.3	1.4	0.9x0.7	0.7	4.4x3.3	3.4	1.8x1.3	1.4	0.9x0.7	0.7	0.4x0.3	0.3	8.8x6.6	6.8
0.75x Zoom	3.2x2.4	2.5	1.3x1.0	1.0	0.7x0.5	0.5	3.2x2.4	2.5	1.3x1.0	1.0	0.7x0.5	0.5	0.3x0.2	0.3	6.5x4.8	5.0
1.0x Zoom	2.4x1.8	1.9	1.0x0.7	0.8	0.5x0.4	0.4	2.4x1.8	1.9	1.0x0.7	0.8	0.5x0.4	0.4	0.2x0.2	0.2	4.9x3.6	3.75
1.5x Zoom	1.6x1.2	1.3	0.6x0.5	0.5	0.3x0.2	0.3	1.6x1.2	1.3	0.6x0.5	0.5	0.3x0.2	0.3	0.2x0.1	0.1	3.2x2.4	2.5
2.0x Zoom	1.2x0.9	0.9	0.5x0.4	0.4	0.2x0.2	0.2	1.2x0.9	0.9	0.5x0.4	0.4	0.2x0.2	0.2	0.1x0.1	0.1	2.4x1.8	1.9

Notes

- Chart specifications are based on nominal magnifications. Actual magnification is calibrated to NIST-traceable calibration standards.
- As measured on an optically smooth surface and 1X magnification selector lens by using high resolution camera on Elite K or I.
- As measured on a rough-polished Si wafer and 1X magnification selector lens.
- Optical resolution based on Sparrow Criteria at 535nm.
- As demonstrated by taking one sigma standard deviation of surface roughness value Sq, based on 30 PSI measurements on SiC reference mirror using Elite X with PZT scanner. Sq repeatability is 0.02 nm using Elite X with motor scanner. When Elite K or I is used, Sq repeatability is 0.03 nm.
- Dependent on the refractive index and thickness of the transmissive material.
- The 1.0X objective and 0.55x zoom provide a maximum FOV of 16.5 mm diameter.

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