NPFLEX Objectives Chart

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		3.7		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		11.3		18.9		26.7		39.1	
Max Slope on Rough Surfaces (deg)[3]	62		65		65		N/A		70		75		81		87	
Optical Resolution (µm)[4]	3.8		2.2		2.1		1.1		0.9		0.7		0.5		0.33	
Tallest Sample: with XY Stage (mm)	340		340		340		340		340		340		340		340	
Tallest Sample: without XY Stage (mm)	397		397		397		397		397		397		397		397	
Vertical Resolution (nm)[5]	<0.15		<0.15		<0.15		<0.15		<0.15		<0.15		<0.15		<0.15	
	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																
0.55x zoom	4.6 x 3.5	7.2	2.3 x 1.7	3.6	2.3 x 1.7	3.6	1.2 x 0.9	1.8	1.2 x 0.9	1.8	0.6 x 0.4	0.9	0.2 x 0.2	0.4	0.10 x 0.08	0.16
0.75x zoom	3.4 x 2.5	5.3	1.7 x 1.3	2.6	1.7 x 1.3	2.6	0.8 x 0.6	1.3	0.8 x 0.6	1.3	0.4 x 0.3	0.7	0.2 x 0.1	0.3	0.07 x 0.06	0.11
1.0x zoom	2.5 x 1.9	4.0	1.3 x 1.0	2.0	1.3 x 1.0	2.0	0.6 x 0.5	1.0	0.6 x 0.5	1.0	0.3 x 0.2	0.5	0.1 x 0.1	0.2	0.06 x 0.04	0.09
1.5x zoom	1.7 x 1.3	2.6	0.8 x 0.6	1.3	0.8 x 0.6	1.3	0.4 x 0.3	0.7	0.4 x 0.3	0.7	0.2 x 0.2	0.3	0.1 x 0.1	0.1	0.04 x 0.03	0.06
2.0x zoom	1.3 x 1.0	2.0	0.6 x 0.5	1.0	0.6 x 0.5	1.0	0.3 x 0.2	0.5	0.3 x 0.2	0.5	0.2 x 0.1	0.2	0.1 x 0.0	0.1	0.03 x 0.02	0.04

NPFLEX Objectives Chart

Non-Turret Mountable Objectives

	XLWD Industrial Objectives (Parfocal with each other)			Through Transmissive Media Objectives (Parfocal with each other)				Low Magnification Objectives	
Magnification[1]	2X	5X	10X	2X	5X	10X	20X	1.0X	1.5X
Working Distance (mm)	34	34	34	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	0.28	0.055	0.14	0.25	0.28	0.04	0.14
Max Slope on Shiny Surfaces (deg)[2]	2.4	5.9	11.3	2.4	5.9	11.3	13	0.8	1.8
Optical Resolution (µm)[4]	4.9	1.9	1.0	4.9	1.9	1.1	1.0	6.7	6.5
Tallest Sample: with XY Stage (mm)	248	248	248	279	279	279	279	82	82
Tallest Sample: without XY Stage (mm)	304	304	304	336	336	336	336	75	75
Vertical Resolution (nm)[5]	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
	FOV (X by Y) (mm) / **Spatial Sampling (µm)**								
Standard Camera									
0.55x zoom	5.8 x 4.3 / 9.0	2.3 x 1.7 / 3.6	1.2 x 0.9 / 1.8	5.8 x 4.3 / 9.0	2.3 x 1.7 / 3.6	1.2 x 0.9 / 1.8	0.6 x 0.4 / 0.9	11.5 x 8.7 / 18.0	7.7 x 5.8 / 12.0
0.75x zoom	4.2 x 3.2 / 6.6	1.7 x 1.3 / 2.6	0.8 x 0.6 / 1.3	4.2 x 3.2 / 6.6	1.7 x 1.3 / 2.6	0.8 x 0.6 / 1.3	0.4 x 0.3 / 0.7	8.4 x 6.4 / 13.2	5.6 x 4.2 / 8.8
1.0x zoom	3.2 x 2.4 / 4.95	1.3 x 1.0 / 1.98	0.6 x 0.5 / 0.99	3.2 x 2.4 / 4.95	1.3 x 1.0 / 2.0	0.6 x 0.5 / 1.0	0.3 x 0.2 / 0.5	6.3 x 4.8 / 9.9	4.2 x 3.2 / 6.6
1.5x zoom	2.1 x 1.6 / 3.3	0.8 x 0.6 / 1.3	0.4 x 0.3 / 0.7	2.1 x 1.6 / 3.3	0.8 x 0.6 / 1.3	0.4 x 0.3 / 0.7	0.2 x 0.2 / 0.3	4.2 x 3.2 / 6.6	2.8 x 2.1 / 4.4
2.0x zoom	1.6 x 1.2 / 2.5	0.6 x 0.5 / 1.0	0.3 x 0.2 / 0.5	1.6 x 1.2 / 2.5	0.6 x 0.5 / 1.0	0.3 x 0.2 / 0.5	0.2 x 0.1 / 0.2	3.2 x 2.4 / 5.0	2.1 x 1.6 / 3.3

Notes

1. Chart specifications are based on nominal magnifications. Actual magnification is calibrated to National Institute of Standards Technology (NIST) traceable calibration standards.
2. As measured on an optically smooth surface and 1X magnification selector lens.
3. As measured on a rough-polished Si wafer and 1X magnification selector lens.
4. Optical resolution based on Sparrow Criteria at 535nm.
5. As demonstrated by a PSI difference measurement on a SiC reference mirror with nulled fringes and 10 averages.
6. Dependent on the index and thickness of the transmissive material.

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