

12X Zoom

Field of View Matrix

12X Zoom Field of View Matrix (in mm at nominal W.D.)

Lens Attachment	Working Distance	Camera Formats/Parameters	0.5X Adapter Low-High	0.67X Adapter Low-High	1X Adapter Low-High	1.33X Adapter Low-High	2X Adapter Low-High	3.3X Adapter Low-High	Resolve Limit (Microns) Low-High	Depth of Field (mm) Low-High
0.25X (2)0.005 - 0.025 NA 1-50011	341	Mag.	0.07X - 0.87X	0.10X - 1.20X	0.15X - 1.75X	0.19X - 2.33X	0.29X - 3.50X	0.50X - 5.78X	66.66 - 13.34	20.00 - 0.80
		Field 1/4"	57.14 - 4.59	41.16 - 3.40	27.60 - 2.28	21.05 - 1.72	13.9 - 1.14	8.36 - 0.69	66.66 - 13.34	20.00 - 0.80
		Field 1/3"	85.71 - 6.89	61.73 - 5.10	41.38 - 3.42	31.57 - 2.57	20.69 - 1.71	12.54 - 1.04	66.66 - 13.34	20.00 - 0.80
		Field 1/2"	—	82.32 - 6.80	55.16 - 4.56	42.10 - 3.43	27.58 - 2.28	16.72 - 1.38	66.66 - 13.34	20.00 - 0.80
		Field 2/3"	—	(1) 72.00 - 9.35	75.88 - 6.28	57.89 - 4.72	37.94 - 3.14	22.99 - 1.90	66.66 - 13.34	20.00 - 0.80
0.5X 0.009 - 0.051 N.A. 1-50012	165	Mag.	0.14X - 1.75X	0.20X - 2.40X	0.29X - 3.50X	0.39X - 4.66X	0.58X - 7.00X	0.96X - 11.55X	37.04 - 6.66	6.17 - 0.19
		Field 1/4"	28.57 - 2.28	20.58 - 1.70	13.79 - 1.14	10.25 - 0.86	6.90 - 0.76	4.18 - 0.35	37.04 - 6.66	6.17 - 0.19
		Field 1/3"	42.85 - 3.42	30.87 - 2.55	20.69 - 1.71	15.38 - 1.29	10.34 - 0.86	6.27 - 0.52	37.04 - 6.66	6.17 - 0.19
		Field 1/2"	—	41.16 - 3.40	27.58 - 2.28	20.51 - 1.72	13.79 - 1.14	8.36 - 0.69	37.04 - 6.66	6.17 - 0.19
		Field 2/3"	—	(1) 36.0 - 4.68	37.94 - 3.14	28.20 - 2.36	18.97 - 1.57	11.50 - 0.95	37.04 - 6.66	6.17 - 0.19
0.75X 0.014 - 0.076 N.A. 1-50013	108	Mag.	0.22X - 2.62X	0.29X - 3.50X	0.44X - 5.30X	0.58X - 6.98X	0.87X - 10.50X	1.45X - 17.49X	23.80 - 4.44	2.55 - 0.09
		Field 1/4"	18.18 - 1.52	13.72 - 1.14	9.19 - 0.76	6.89 - 0.57	4.60 - 0.38	2.78 - 0.23	23.80 - 4.44	2.55 - 0.09
		Field 1/3"	27.27 - 2.29	20.58 - 1.70	13.79 - 1.14	10.34 - 0.85	6.89 - 0.57	4.18 - 0.35	23.80 - 4.44	2.55 - 0.09
		Field 1/2"	—	27.44 - 2.27	18.34 - 1.52	13.79 - 1.14	9.19 - 0.76	5.56 - 0.46	23.80 - 4.44	2.55 - 0.09
		Field 2/3"	—	(1) 24.30 - 3.12	25.30 - 2.09	18.96 - 1.57	12.64 - 1.05	7.67 - 0.63	23.80 - 4.44	2.55 - 0.09
None 0.019 - 0.101 N.A.	86	Mag.	0.29X - 3.49X	0.39X - 4.70X	0.58X - 7.00X	0.77X - 9.31X	1.16X - 14.00X	1.91X - 23.1X	18.52 - 3.34	1.39 - 0.05
		Field 1/4"	13.79 - 1.14	10.29 - 0.85	6.90 - 0.57	5.19 - 0.43	3.45 - 0.29	2.09 - 0.17	18.52 - 3.34	1.39 - 0.05
		Field 1/3"	20.69 - 1.72	15.44 - 1.28	10.34 - 0.86	7.79 - 0.64	5.18 - 0.43	3.13 - 0.26	18.52 - 3.34	1.39 - 0.05
		Field 1/2"	—	20.58 - 1.70	13.79 - 1.14	10.39 - 0.86	6.90 - 0.57	4.18 - 0.35	18.52 - 3.34	1.39 - 0.05
		Field 2/3"	—	(1) 18.20 - 2.34	18.97 - 1.57	14.28 - 1.18	9.49 - 0.78	5.75 - 0.48	18.52 - 3.34	1.39 - 0.05
1.5X 0.028 - 0.151 N.A. 1-50014	50	Mag.	0.43X - 5.23X	0.58X - 7.00X	0.87X - 10.50X	1.16X - 14.0X	1.74X - 21.00X	2.87X - 34.65X	12.34 - 2.24	0.64 - 0.02
		Field 1/4"	9.30 - 0.76	6.86 - 0.57	4.60 - 0.38	3.44 - 0.28	2.30 - 0.19	1.39 - 0.12	12.34 - 2.24	0.64 - 0.02
		Field 1/3"	13.95 - 1.14	10.29 - 0.85	6.89 - 0.57	5.17 - 0.44	3.45 - 0.29	2.09 - 0.17	12.34 - 2.24	0.64 - 0.02
		Field 1/2"	—	13.72 - 1.13	9.19 - 0.76	6.89 - 0.57	4.60 - 0.38	2.78 - 0.23	12.34 - 2.24	0.64 - 0.02
		Field 2/3"	—	(1) 12.20 - 1.55	12.64 - 1.05	9.48 - 0.78	6.33 - 0.52	3.83 - 0.32	12.34 - 2.24	0.64 - 0.02
2.0X 0.038 - 0.202 N.A. 1-50015	37	Mag.	0.58X - 6.98X	0.78X - 9.40X	1.16X - 14.00X	1.54X - 18.6X	2.32X - 28.00X	3.83X - 46.2X	9.00 - 1.66	0.35 - 0.01
		Field 1/4"	6.89 - 0.57	5.14 - 0.43	3.45 - 0.29	2.59 - 0.21	1.73 - 0.15	1.05 - 0.09	9.00 - 1.66	0.35 - 0.01
		Field 1/3"	10.34 - 0.85	7.72 - 0.64	5.18 - 0.43	3.89 - 0.32	2.59 - 0.22	1.57 - 0.13	9.00 - 1.66	0.35 - 0.01
		Field 1/2"	—	10.29 - 0.85	6.90 - 0.57	5.19 - 0.43	3.45 - 0.29	2.09 - 0.17	9.00 - 1.66	0.35 - 0.01
		Field 2/3"	—	(1) 9.10 - 1.17	9.49 - 0.78	7.14 - 0.59	4.75 - 0.40	2.88 - 0.24	9.00 - 1.66	0.35 - 0.01

(1) Vignetting occurs at zoom settings less than 0.9X.

(2) N.A. varies depending on zoom setting.

12X UltraZoom

Field of View Matrix

12X UltraZoom Field of View Matrix
(for part number's 1-50502, 1-50503, and 1-50504 in mm)

Objective Lens (Mitutoyo) Long W.D.	Working Distance (mm)	Camera Formats/ Parameters	1X Adapter Low - High	1.33X Adapter Low - High	2X Adapter Low - High	3.3X Adapter Low - High
5X 0.14 NA* 1-60226	34	Mag.	(1) 3.57X - 16.66X	(2) 3.26X - 22.16X	2.77X - 33.31X	4.53X - 54.97X
		Field 1/4"	1.12 - 0.24	1.22 - 0.18	1.44 - 0.12	0.88 - 0.08
		Field 1/3"	1.68 - 0.36	1.84 - 0.27	2.17 - 0.18	1.33 - 0.11
		Field 1/2"	2.24 - 0.48	2.45 - 0.36	2.89 - 0.24	1.76 - 0.15
		Field 2/3"	—	2.45 - 0.49	3.97 - 0.33	2.43 - 0.20
10X 0.28 NA* 1-60227	33	Mag.	(1) 7.14X - 33.31X	(2) 6.50X - 44.30X	5.54X - 66.63X	9.15X - 109.94X
		Field 1/4"	0.56 - 0.12	0.61 - 0.09	0.72 - 0.06	0.43 - 0.03
		Field 1/3"	0.84 - 0.18	0.92 - 0.13	1.08 - 0.09	0.66 - 0.06
		Field 1/2"	1.12 - 0.24	1.23 - 0.18	1.44 - 0.12	0.87 - 0.08
		Field 2/3"	—	1.23 - 0.25	1.99 - 0.17	1.20 - 0.10
20X 0.42 NA* 1-60228	20	Mag.	(1) 14.28X - 64.63X	(2) 13.10X - 85.96X	11.08X - 133.25X	18.29X - 219.870X
		Field 1/4"	0.28 - 0.06	0.30 - 0.04	0.36 - 0.03	0.22 - 0.02
		Field 1/3"	0.42 - 0.09	0.46 - 0.07	0.54 - 0.04	0.33 - 0.04
		Field 1/2"	0.56 - 0.12	0.61 - 0.09	0.72 - 0.06	0.44 - 0.05
		Field 2/3"	—	0.61 - 0.13	0.99 - 0.08	0.60 - 0.05
50X 0.55 NA* 1-60229	13	Mag.	(1) 35.69X - 166.57X	(2) 40.00X - 221.54X	27.50X - 333.13X	45.35X - 549.69X
		Field 1/4"	0.11 - 0.02	0.10 - 0.02	0.14 - 0.01	0.085 - 0.0006
		Field 1/3"	0.17 - 0.04	0.15 - 0.05	0.22 - 0.02	0.13 - 0.01
		Field 1/2"	0.22 - 0.05	0.20 - 0.04	(2) 0.17 - 0.03	0.17 - 0.016
		Field 2/3"	—	0.20 - 0.05	0.40 - 0.03	0.24 - 0.02

Note: This system is not recommended for use with a 2/3" CCD.

(1) Zoom setting at 1.5X.

(2) Zoom setting at 1.0X.

*N.A. at full zoom. N.A. varies with zoom setting.

12X Zoom Internal Co-axial Zoom Field of View Matrix

Field of View Matrix for Internal Co-axial Zoom 1-50487 (in mm)

Lens Attachment	Working Distance	Camera Formats/Parameters	0.5X Adapter Low-High	0.67X Adapter Low-High	1X Adapter Low-High	1.33X Adapter Low-High	2X Adapter Low-High	3.3X Adapter Low-High	Resolve Limit (Microns) Low-High	Depth of Field (mm) Low-High
None 0.019 - 0.101 N.A.	86	Mag.	0.29X - 3.49X	0.39X - 4.70X	0.58X - 7.00X	0.77X - 9.31X	1.16X - 14.00X	1.91X - 23.10X	18.52 - 3.34	1.39 - 0.05
		Field 1/4"	13.79 - 1.14	10.29 - 0.85	6.90 - 0.57	5.19 - 0.43	3.45 - 0.29	2.09 - 0.17	18.52 - 3.34	1.39 - 0.05
		Field 1/3"	20.69 - 1.72	15.44 - 1.28	10.34 - 0.86	7.79 - 0.64	5.18 - 0.43	3.13 - 0.26	18.52 - 3.34	1.39 - 0.05
		Field 1/2"	—	20.58 - 1.70	13.79 - 1.14	10.39 - 0.86	6.90 - 0.57	4.18 - 0.35	18.52 - 3.34	1.39 - 0.05
		Field 2/3"	—	(1) 18.20 - 2.34	18.97 - 1.57	14.28 - 1.18	9.49 - 0.78	5.75 - 0.48	18.52 - 3.34	1.39 - 0.05
1.5X 0.028 - 0.151 N.A. 1-50014	50	Mag.	0.43X - 5.23X	0.58X - 7.00X	0.87X - 10.50X	1.16X - 14.0X	1.74X - 21.00X	2.87X - 34.65X	12.34 - 2.24	0.64 - 0.02
		Field 1/4"	9.30 - 0.76	6.86 - 0.57	4.60 - 0.38	3.44 - 0.28	2.30 - 0.19	1.39 - 0.12	12.34 - 2.24	0.64 - 0.02
		Field 1/3"	13.95 - 1.14	10.29 - 0.85	6.89 - 0.57	5.17 - 0.44	3.45 - 0.29	2.09 - 0.17	12.34 - 2.24	0.64 - 0.02
		Field 1/2"	—	13.72 - 1.13	9.19 - 0.76	6.89 - 0.57	4.60 - 0.38	2.78 - 0.23	12.34 - 2.24	0.64 - 0.02
		Field 2/3"	—	(1) 12.20 - 1.55	12.64 - 1.05	9.48 - 0.78	6.33 - 0.52	3.83 - 0.32	12.34 - 2.24	0.64 - 0.02
2.0X 0.038 - 0.202 N.A. 1-50015	37	Mag.	0.58X - 6.98X	0.78X - 9.40X	1.16X - 14.00X	1.54X - 18.6X	2.32X - 28.00X	3.83X - 46.20X	9.00 - 1.66	0.35 - 0.01
		Field 1/4"	6.89 - 0.57	5.14 - 0.43	3.45 - 0.29	2.59 - 0.21	1.73 - 0.15	1.05 - 0.09	9.00 - 1.66	0.35 - 0.01
		Field 1/3"	10.34 - 0.85	7.72 - 0.64	5.18 - 0.43	3.89 - 0.32	2.59 - 0.22	1.57 - 0.13	9.00 - 1.66	0.35 - 0.01
		Field 1/2"	—	10.29 - 0.85	6.90 - 0.57	5.19 - 0.43	3.45 - 0.29	2.09 - 0.17	9.00 - 1.66	0.35 - 0.01
		Field 2/3"	—	(1) 9.10 - 1.17	9.49 - 0.78	7.14 - 0.59	4.75 - 0.40	2.88 - 0.24	9.00 - 1.66	0.35 - 0.01

(1) Zoom Setting at 1.0=X.