

DOF_{STEP} (μm)

To Configure:	
Pixel Width: (PW) (μm)	5.1
e-factor low NA:	2
e-factor high NA:	2
DOF Overlap:	1.4

Camera pixel info:	
5D mkII	6.4
450D	5.1

λ_0 (nm) =	550	$n=1$									
Resolving Power: (μm)	2.75	2.12	1.96	1.38	1.31	1.10	0.92	0.79	0.69	0.55	
NA:	0.10	0.13	0.14	0.20	0.21	0.25	0.30	0.35	0.40	0.50	
Magn. m	DOF_{STEP}										
3x	64	42	37	22							
4x	58	37	33	19							
5x	54	34	30	17							
6x	51	33	29	16							
7x	50	31	27	15	14	10	7.8				
8x	48	30	27	14	13	9.9	7.4				
9x	47	29	26	14	13	9.5	7.1				
10x	47	29	25	13	12	9.2	6.8				
11x			25	13	12	8.9	6.6				
12x				13	12	8.7	6.4				
13x				13	12	8.5	6.2				
14x				12	11	8.4	6.1				
15x					11	8.2	6.0	4.6	3.7		
16x					11	8.1	5.9	4.5	3.6		
17x					11	8.0	5.8	4.4	3.5		
18x					11	7.9	5.7	4.4	3.5		
19x						7.8	5.6	4.3	3.4		
20x						7.7	5.6	4.2	3.4		
22x							5.5	4.2	3.3		
24x							5.4	4.1	3.2		
26x								4.0	3.2		
28x								4.0	3.1		
30x								3.9	3.1	2.1	
32x								3.9	3.0	2.0	
34x									3.0	2.0	
36x									3.0	2.0	
38x									2.9	2.0	
40x									2.9	1.9	
42x									2.9	1.9	
44x									2.9	1.9	
46x									2.9	1.9	
48x									2.8	1.9	
50x									2.8	1.9	
52x										1.9	
54x										1.8	
56x										1.8	

PW = Pixel width
m = magnification

Cicle of confusion: (1)

$$C = ePW$$

Calculated DOF: (2)

$$DOF_{tot} = \frac{\lambda_0 n}{NA^2} + \frac{nC}{mNA}$$

Step distance: (3)

$$DOF_{STEP} = \frac{DOF_{tot}}{Overlap}$$

(1), (3) UW
(2) <http://www.microscopyu.com/articles/formulas/formulasfielddepth.html>

Res. Limit at sensor (μm)

λ (nm) =	550										
Resolving Power: (μm)	2.75	2.12	1.96	1.38	1.31	1.10	0.92	0.79	0.69	0.55	
NA:	0.10	0.13	0.14	0.20	0.21	0.25	0.30	0.35	0.40	0.50	
Magn. M											
3x	8.3	6.3	5.9	4.1							
4x	11.0	8.5	7.9	5.5							
5x	13.8	10.6	9.8	6.9							
6x	16.5	12.7	11.8	8.3							
7x	19.3	14.8	13.8	9.6	9.2	7.7	6.4				
8x	22.0	16.9	15.7	11.0	10.5	8.8	7.3				
9x	24.8	19.0	17.7	12.4	11.8	9.9	8.3				
10x	27.5	21.2	19.6	13.8	13.1	11.0	9.2				
11x			21.6	15.1	14.4	12.1	10.1				
12x				16.5	15.7	13.2	11.0				
13x				17.9	17.0	14.3	11.9				
14x				19.3	18.3	15.4	12.8				
15x					19.6	16.5	13.8	11.8	10.3		
16x					21.0	17.6	14.7	12.6	11.0		
17x					22.3	18.7	15.6	13.4	11.7		
18x					23.6	19.8	16.5	14.1	12.4		
19x						20.9	17.4	14.9	13.1		
20x						22.0	18.3	15.7	13.8		
22x							20.2	17.3	15.1		
24x							22.0	18.9	16.5		
26x								20.4	17.9		
28x								22.0	19.3		
30x								23.6	20.6	16.5	
32x								25.1	22.0	17.6	
34x									23.4	18.7	
36x									24.8	19.8	
38x									26.1	20.9	
40x									27.5	22.0	
42x									28.9	23.1	
44x									30.3	24.2	
46x									31.6	25.3	
48x									33.0	26.4	
50x									34.4	27.5	
52x										28.6	
54x										29.7	
56x										30.8	

Resolving Power: (4)

$$RP = \frac{\lambda_0}{2NA}$$

Res. Limit at sensor: (5)

$$RL = mRP$$

(4) <http://www.microscopyu.com/articles/formulas/formulasresolution.html>
(5) UW