

### Supplementary Table 1

Calculated valve lengths for different flow channel widths (50, 75, 100, 150, 200, and 300  $\mu\text{m}$ ), control channel widths (either 1x or 1.5x the flow channel width), spacings between and start of square photoresist (25, 50, and 100  $\mu\text{m}$ ), and overlaps between rounded square photoresists (25, 50, 100, 200, and 300  $\mu\text{m}$ ). See Figure 1 for a diagram of different dimensions.

Flow Width	Control Width	Spacing	Overlap	AZ50 Length
50	1	25	25	150
50	1	25	50	200
50	1	25	100	300
50	1	25	200	500
50	1	25	300	700
50	1	50	25	200
50	1	50	50	250
50	1	50	100	350
50	1	50	200	550
50	1	50	300	750
50	1	100	25	300
50	1	100	50	350
50	1	100	100	450
50	1	100	200	650
50	1	100	300	850
50	1.5	25	25	175
50	1.5	25	50	225
50	1.5	25	100	325
50	1.5	25	200	525
50	1.5	25	300	725
50	1.5	50	25	225
50	1.5	50	50	275
50	1.5	50	100	375
50	1.5	50	200	575
50	1.5	50	300	775
50	1.5	100	25	325
50	1.5	100	50	375
50	1.5	100	100	475
50	1.5	100	200	675
50	1.5	100	300	875
75	1	25	25	175
75	1	25	50	225
75	1	25	100	325
75	1	25	200	525
75	1	25	300	725
75	1	50	25	225
75	1	50	50	275
75	1	50	100	375
75	1	50	200	575
75	1	50	300	775
75	1	100	25	325
75	1	100	50	375
75	1	100	100	475
75	1	100	200	675
75	1	100	300	875

75	1.5	25	25	212.5
75	1.5	25	50	262.5
75	1.5	25	100	362.5
75	1.5	25	200	562.5
75	1.5	25	300	762.5
75	1.5	50	25	262.5
75	1.5	50	50	312.5
75	1.5	50	100	412.5
75	1.5	50	200	612.5
75	1.5	50	300	812.5
75	1.5	100	25	362.5
75	1.5	100	50	412.5
75	1.5	100	100	512.5
75	1.5	100	200	712.5
75	1.5	100	300	912.5
100	1	25	25	200
100	1	25	50	250
100	1	25	100	350
100	1	25	200	550
100	1	25	300	750
100	1	50	25	250
100	1	50	50	300
100	1	50	100	400
100	1	50	200	600
100	1	50	300	800
100	1	100	25	350
100	1	100	50	400
100	1	100	100	500
100	1	100	200	700
100	1	100	300	900
100	1.5	25	25	250
100	1.5	25	50	300
100	1.5	25	100	400
100	1.5	25	200	600
100	1.5	25	300	800
100	1.5	50	25	300
100	1.5	50	50	350
100	1.5	50	100	450
100	1.5	50	200	650
100	1.5	50	300	850
100	1.5	100	25	400
100	1.5	100	50	450
100	1.5	100	100	550
100	1.5	100	200	750
100	1.5	100	300	950
150	1	25	25	250
150	1	25	50	300
150	1	25	100	400
150	1	25	200	600
150	1	25	300	800
150	1	50	25	300
150	1	50	50	350
150	1	50	100	450

150	1	50	200	650
150	1	50	300	850
150	1	100	25	400
150	1	100	50	450
150	1	100	100	550
150	1	100	200	750
150	1	100	300	950
150	1.5	25	25	325
150	1.5	25	50	375
150	1.5	25	100	475
150	1.5	25	200	675
150	1.5	25	300	875
150	1.5	50	25	375
150	1.5	50	50	425
150	1.5	50	100	525
150	1.5	50	200	725
150	1.5	50	300	925
150	1.5	100	25	475
150	1.5	100	50	525
150	1.5	100	100	625
150	1.5	100	200	825
150	1.5	100	300	1025
200	1	25	25	300
200	1	25	50	350
200	1	25	100	450
200	1	25	200	650
200	1	25	300	850
200	1	50	25	350
200	1	50	50	400
200	1	50	100	500
200	1	50	200	700
200	1	50	300	900
200	1	100	25	450
200	1	100	50	500
200	1	100	100	600
200	1	100	200	800
200	1	100	300	1000
200	1.5	25	25	400
200	1.5	25	50	450
200	1.5	25	100	550
200	1.5	25	200	750
200	1.5	25	300	950
200	1.5	50	25	450
200	1.5	50	50	500
200	1.5	50	100	600
200	1.5	50	200	800
200	1.5	50	300	1000
200	1.5	100	25	550
200	1.5	100	50	600
200	1.5	100	100	700
200	1.5	100	200	900
200	1.5	100	300	1100
250	1	25	25	350

250	1	25	50	400
250	1	25	100	500
250	1	25	200	700
250	1	25	300	900
250	1	50	25	400
250	1	50	50	450
250	1	50	100	550
250	1	50	200	750
250	1	50	300	950
250	1	100	25	500
250	1	100	50	550
250	1	100	100	650
250	1	100	200	850
250	1	100	300	1050
250	1.5	25	25	475
250	1.5	25	50	525
250	1.5	25	100	625
250	1.5	25	200	825
250	1.5	25	300	1025
250	1.5	50	25	525
250	1.5	50	50	575
250	1.5	50	100	675
250	1.5	50	200	875
250	1.5	50	300	1075
250	1.5	100	25	625
250	1.5	100	50	675
250	1.5	100	100	775
250	1.5	100	200	975
250	1.5	100	300	1175

id 250  $\mu\text{m}$ ),  
control line  
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these