Characterization of Wet Etching Borosilicate Glass

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- DESCRIPTION OF WORK
  - The goal of this work was to develop a repeatable process for wet etching Borofloat33 borosilicate glass
  - Use of Cr/Au/PR mask allowed for extended etch times
  - AJA Sputterer was used to avoid pinholes

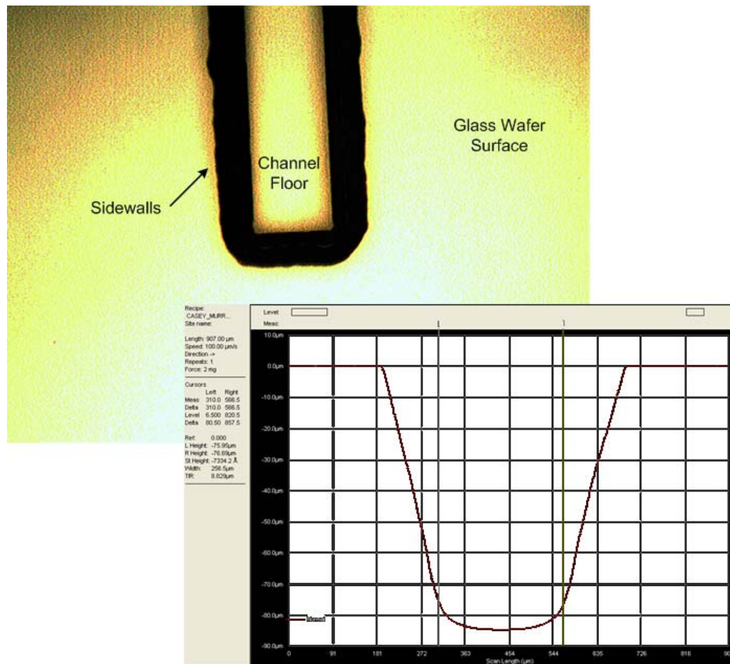

Fig. 1: Top image shows top view of etched channel. Lower image shows profile using P16 profiler

	Cr/Au Mask, 4 min HF Etch				Cr/Au Mask, 11 min HF Etch			
	Pre Etch (um)	Post Etch (um)			Pre Etch (um)	Post Etch (um)		
Feature Size (um)	width	width	depth	UR	width	width	depth	UR
180	169	343.5	38.8	4.50	170.3	501.5	84.7	3.91
175	163.5	333.5	38.8	4.38	165	498	84.6	3.94
170	161.5	332	38.4	4.44	158.3	497.5	84.5	4.01
25	16.5	169.5	36.7	4.17	14.75	326.5	78.3	3.98
20	10.5	165	36	4.29	12	318	77.6	3.94
15	8	169	36	4.47	6.5			

Table 1: Shows amount of undercut for two different wafers etched 4 min. and 11 min. respectively

- MAJOR OBSERVATIONS
  - Using 49% HF an etch rate of ~8 um/min was achieved
  - 10 um of SPR 220-7 lasted for ~11 min in 49% HF allowing for an etch depth of 85 um to be achieved. Deeper etching could have been carried out however etch quality then depends on metal quality.
  - UR of ~4 was consistently obtained