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If you etch some compound semiconductor EPI-layer samplers using Unaxis PM1 etcher with the chlorine-based chemistry, do not use the dry etch recipe with the oxygen in it to etch your dielectric etch masks (SiO$_2$ and SiN$_{x}$) because it will cause a big roughness of your etched bottom surface (micro-disc effects).

**SiO$_2$ Etch (ICP#2):** 0.5Pa, 50/900W, CF$_4$/CHF$_3$ Flow-Rate=30/10 SCCM, **Etch Rate=152 nm/min, Etch Selectivity (SiO$_2$/PR)=1.0**

Figure 1 (a) and (b) SiO$_2$ etch profile (etch time=100 seconds). PR etch mask remains on the top of the etched SiO$_2$ layer.

**Note:** It is over-etched (the etching went through the SiO$_2$ layer and into the underneath Si). The averaged Si etch depth and remaining resist thickness are 48.4 and 367 nm, respectively.
Figure 2 (a) and (b) SiO2 etch profile (etch time=60 seconds). PR etch mask remains on the top of the etched SiO2 layer.

Note:

1) The averaged remaining resist thickness is 0.512 μm.
2) The averaged remaining SiO2 thickness is 47.8 nm.
3) The SiO2 etch rate is 152 nm/min.
4) The etch selectivity (SiO2/resist) is 1.00.
5) The averaged Si etch rate is 138 nm/min.
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Figure 3 SiO$_2$ etch profile (ARC-11 remains on the top after the etching). The etch pattern was created using Holography.