

CF-E16 低損傷磊晶蝕刻機 (Samco 200ip Etcher)

技術資料

Samco RIE-230iP



- ✓ Processing up to $\varnothing 230$ mm ($\varnothing 3'' \times 5$, $\varnothing 4'' \times 3$, $\varnothing 8'' \times 1$)
- ✓ Symmetrical evacuation design coupled to TMP
- ✓ Excellent uniformity - less than $\pm 5\%$ @ $\varnothing 8''$
- ✓ Stable, reproducible process by ESC & He backside cooling
- ✓ Chlorine chemistry process
- ✓ Extensive process library
- ✓ Versatile
- ✓ Compact footprint
- ✓ Global installed base of more than 350 chambers

ICP System



Tornado ICP Coil

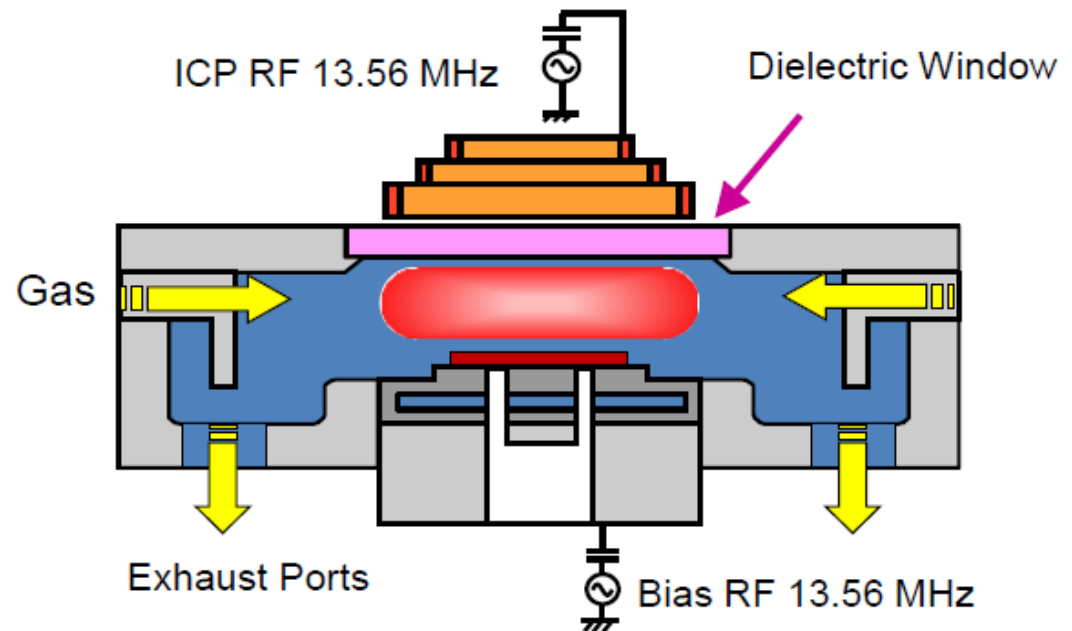
Tornado ICP® Coil

- Uniform Sheet of Plasma Across the Chamber
- Plasma formation from Low Powers & Pressures

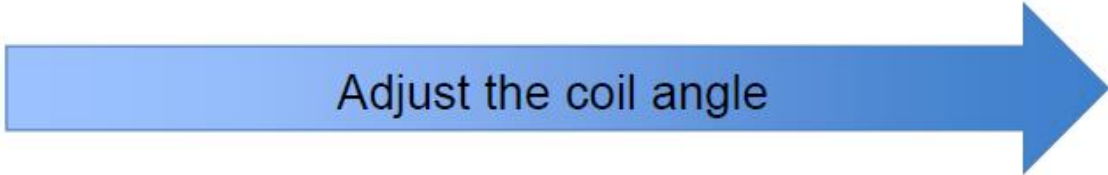


Benefits

1. Uniform Etching
2. Etch Rate Control
3. Low Damage Processing



Tornado ICP Coil -Tuning Angle



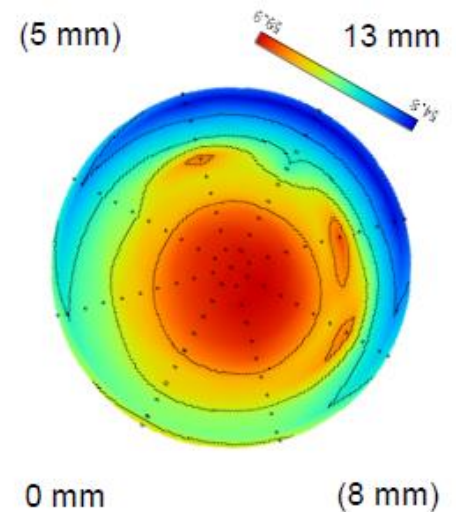
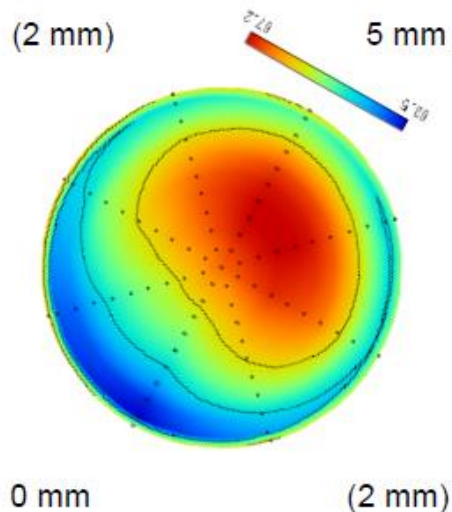
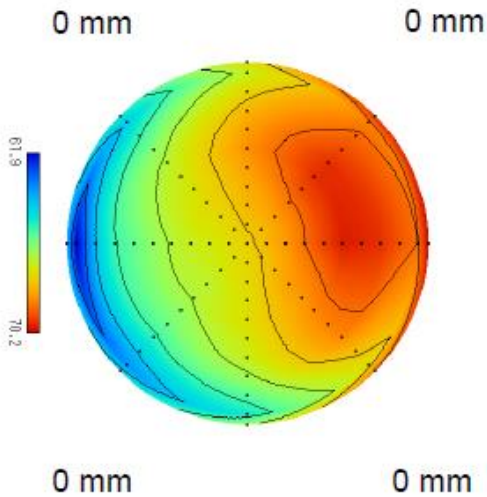
$\pm 2.82\% @ \varnothing 190 \text{ mm}$

Uniformity are for reference only and are not always guaranteed. Performance depends on mask pattern and sample type.

No Adjustment

Adjustment 1
5 mm

Adjustment 2
13 mm

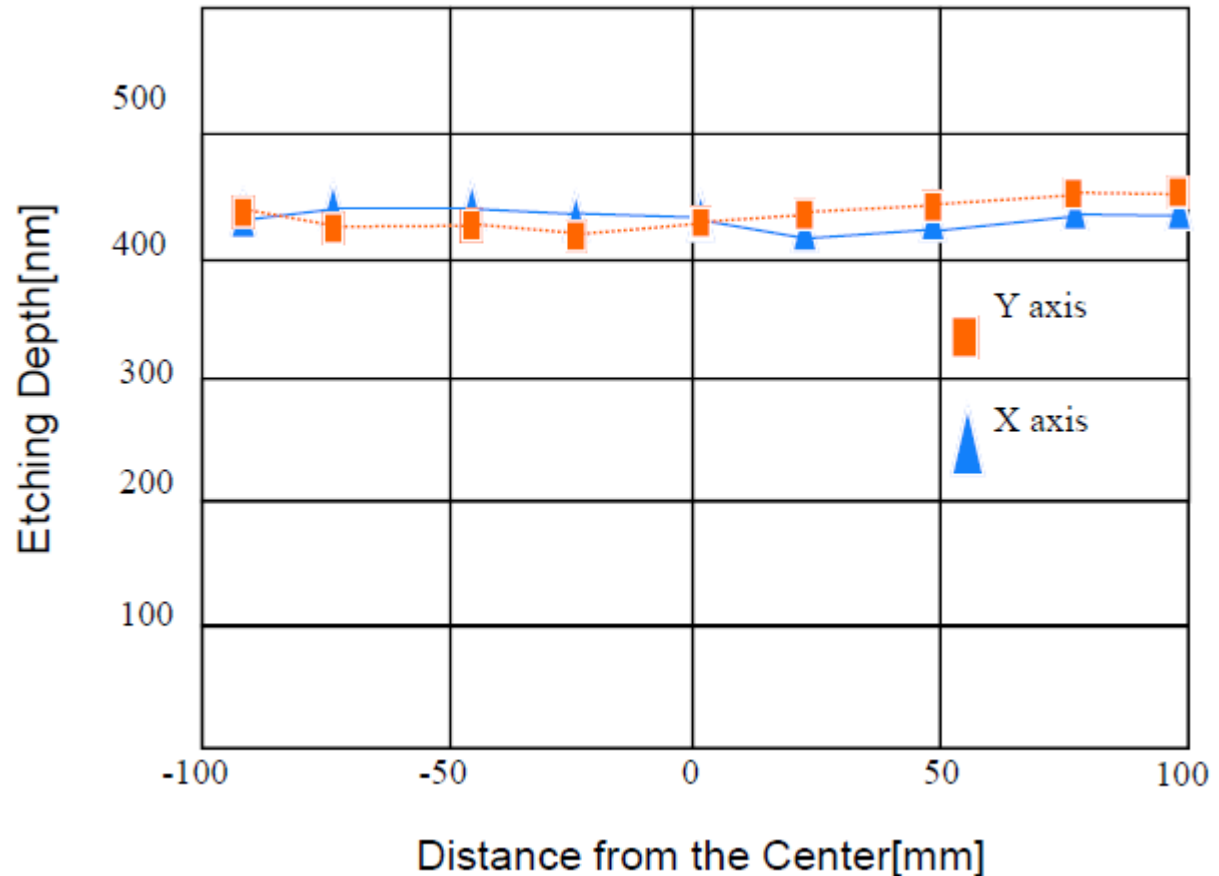


Tornado ICP Coil - Uniformity

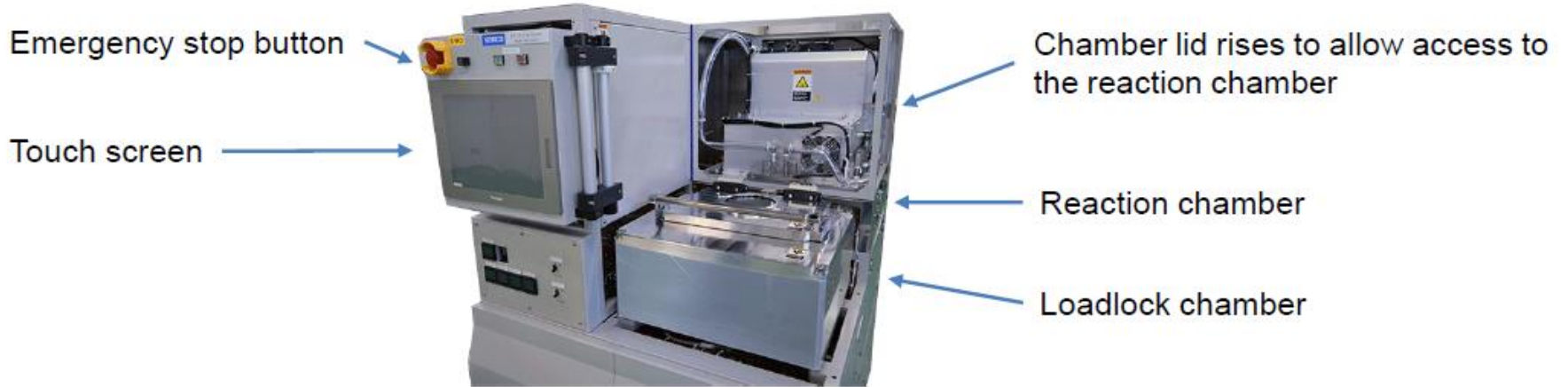
Highly uniform etching with proprietary Tornado Coil

Exceptional uniformity
over ø8 inch wafers

Depth: 420 nm
Material: SiO₂
Uniformity: ±2.5%

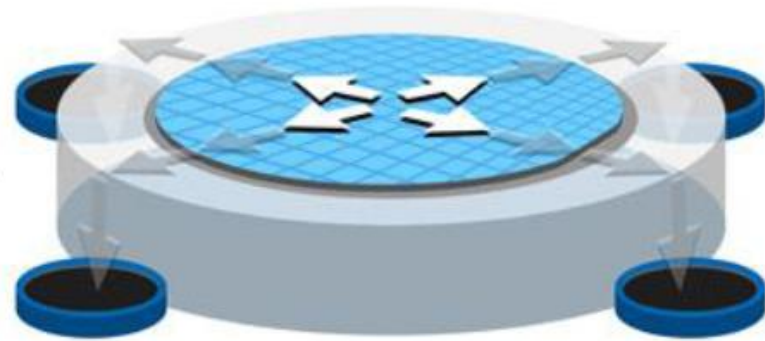
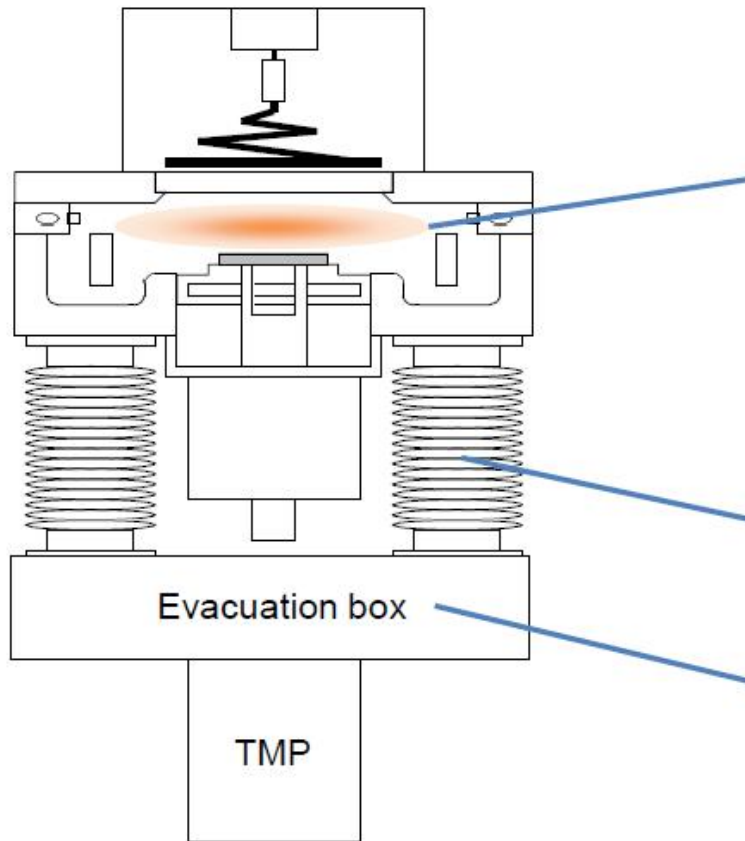


Hardware



Symmetrical Evacuation

Process gas is uniformly evacuated from the four corners of the chamber for excellent uniformity.



TMP (for Ga-related materials)

Field-proven reliability in the etching of Ga-related materials

- 1 year manufacture backed warranty for Ga etching.
- 1 year manufacturer backed for overhaul including rotor.



TMP rotor after using 18 months
→ Still working

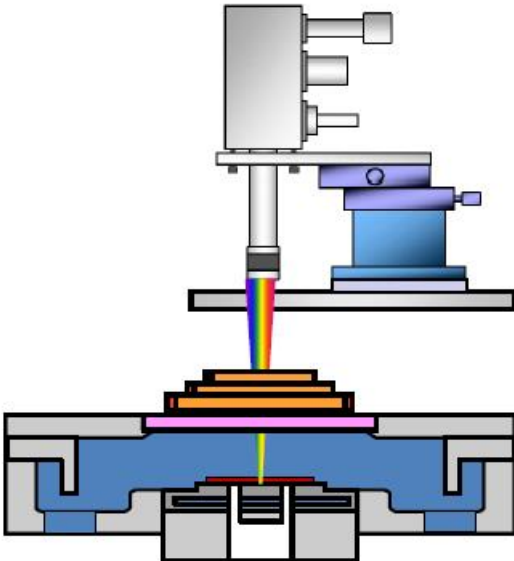


Crashed TMP rotor

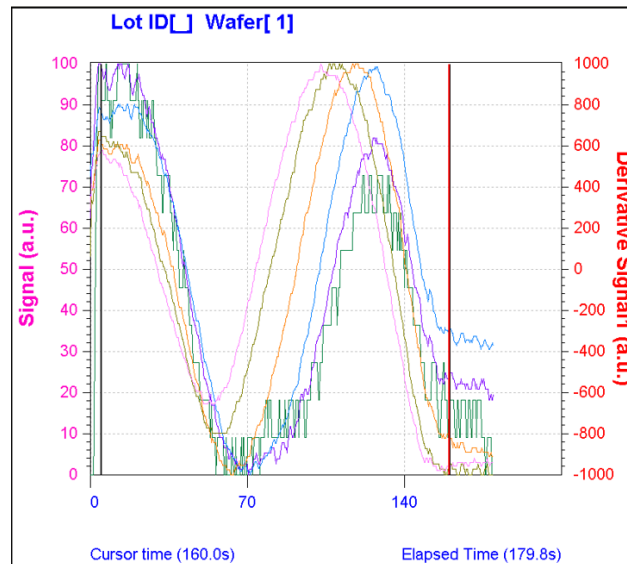
Interferometric EPD

Advanced view at multiple wavelengths simultaneously

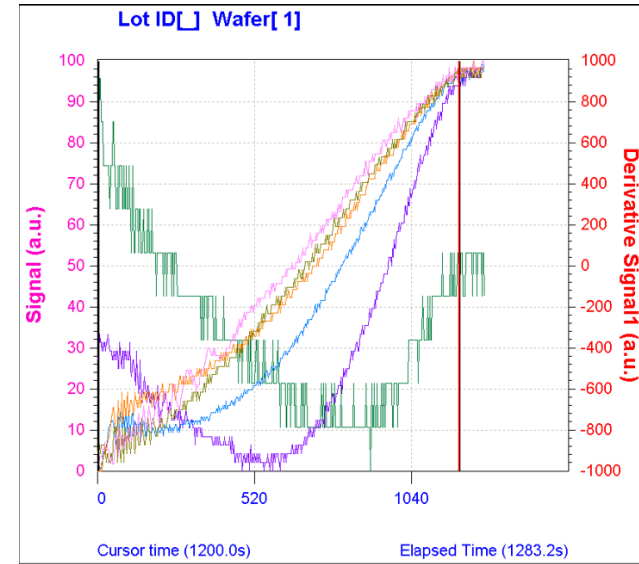
Manual or Automatic
X-Y Stage



P GaN EPD – SF6 etching



AlGaN EPD – Cl2/ BC13 etching



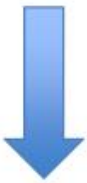
Patented Anti-fog Window

Maintenance-free endpoint detection

- Fabrication of optical, power and RF devices may require **in-situ monitoring** for ICP etching systems.

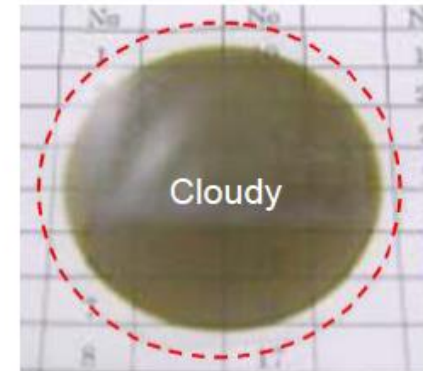
Problems

1. During the etching process, the window required by the in-situ monitor becomes cloudy and measurement becomes impossible.
2. Even if cleaning of the window is carried out during the chamber clean, etching by-products cannot be removed and the window must soon be replaced



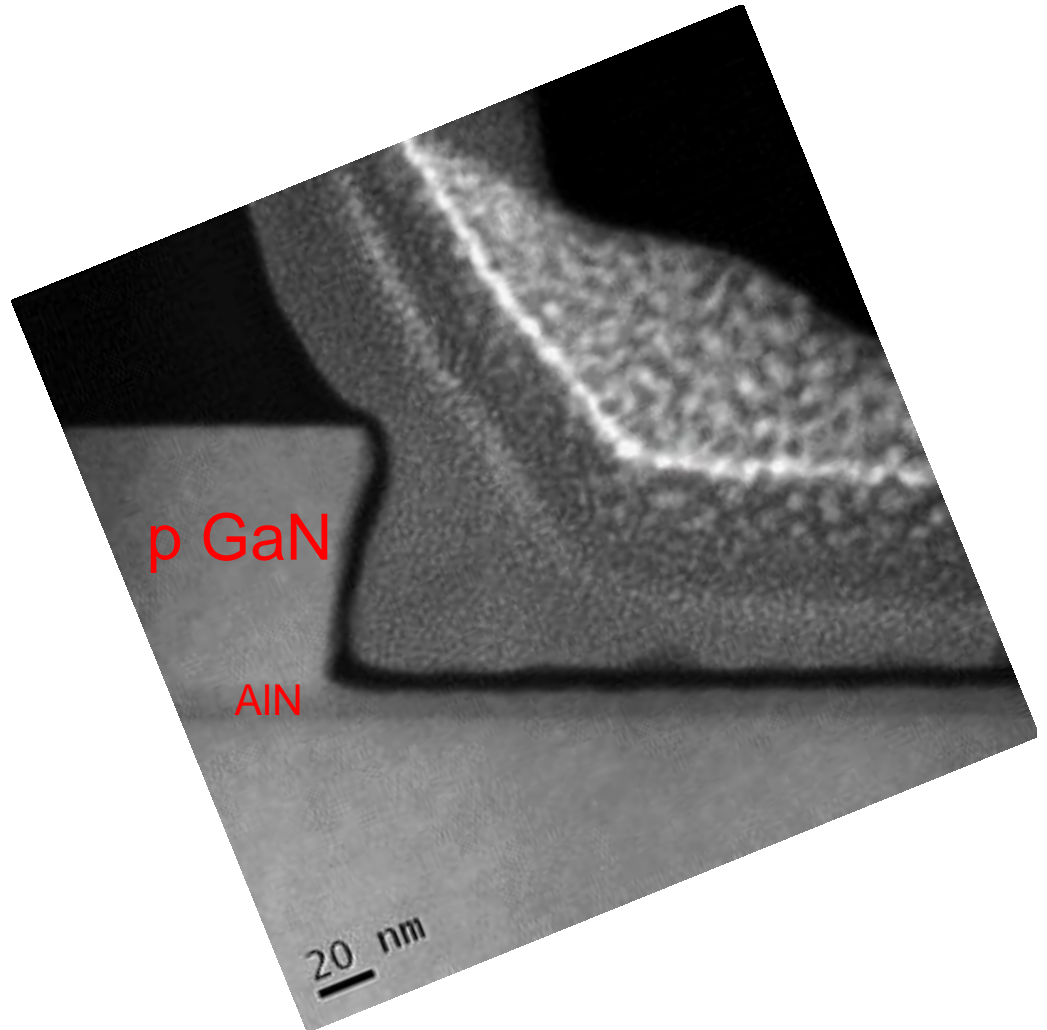
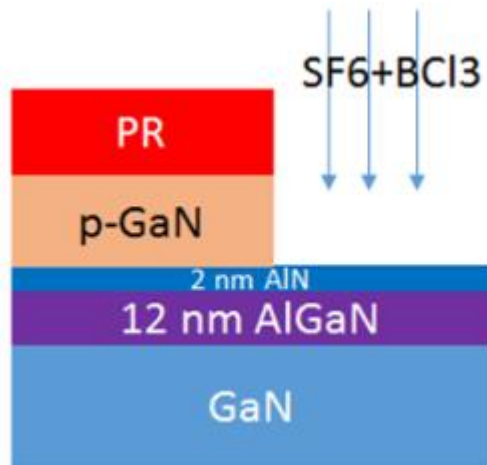
Solution

Samco' patented electrode structure prevents clouding of the window and allows accurate, continuous measurement.



P GaN/AlN High Selectivity Etching

Etching stop at the interlayer



Recessed Gate Etch Evaluation by AFM

Smooth surface retained after etching

