Dielectric Etching Applications

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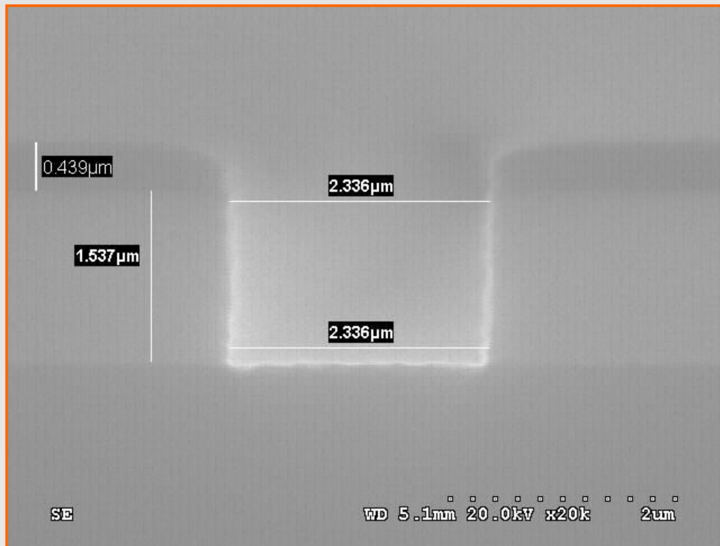
Micro Machining Systems

Oxide mask opening



- **Conditions**
  - Wafer size : 100 mm
  - Feature width : 2.5 µm
  - Etch depth : 1.5 µm
  - Feature shape : Trench
  - Mask : PR
  - Substrate : Si
- **Results**
  - Etch rate : 0.15 µm/min
  - Selectivity : 2
  - uniformity : +/- 5%
  - profile angle : 90° +/-1°

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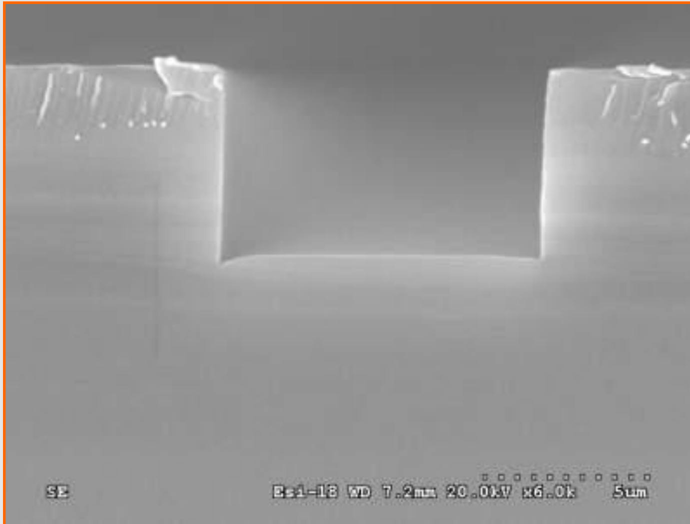
Thermal Oxide etching



Fast etch rate
0.9 µm/min

- **Conditions**
  - Wafer size : 100 mm
  - Feature width : 10 µm
  - Etch depth : 3 µm
  - Feature shape : Trench
  - Mask : PR
  - Substrate : Si
- **Results**
  - **Etch rate : 0.9 µm/min**
  - Selectivity : 1.5
  - Slope : 91°

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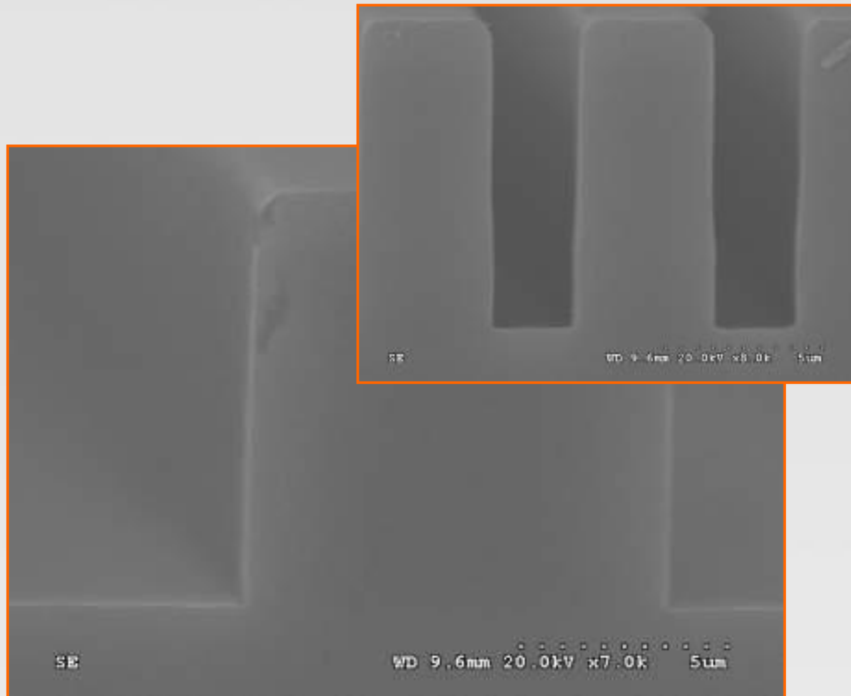
Vertical Oxide etch



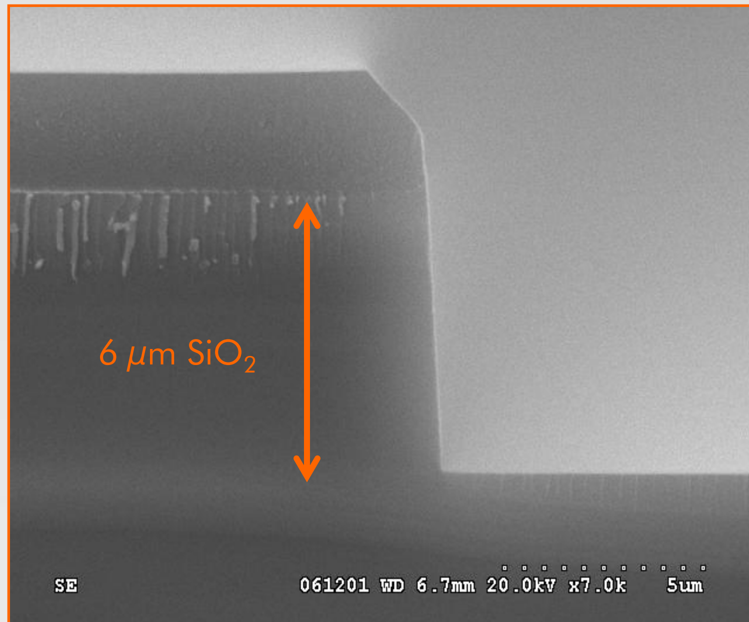
Vertical oxide etch

- **Conditions**
  - Wafer size : 100 mm
  - Feature width : 100 µm
  - Etch depth : 9 µm
  - Feature shape : Trench
  - Mask : Si
  - Substrate : Si
- **Results**
  - Etch rate : 0.56 µm/min
  - Selectivity : 15
  - **Slope : 90-91°**

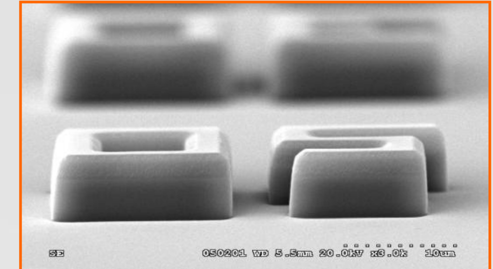
Vertical Oxide etch

- **Conditions**
  - Wafer size : 150 mm
  - Feature width : 5 µm
  - Etch depth : 6 µm
  - Feature shape : Trench
  - Mask : PR
  - Substrate : Si
- **Results**
  - Etch rate : 0.33 µm/min
  - Selectivity : 8
  - Slope : 92.1°

SiO2 etching with negative PR mask



Etch stop on Si layer, with 5 min over-etch.



- **Conditions**
  - Wafer size : 100 mm
  - Feature width : 50 µm
  - Etch depth : 6 µm
  - Mask : neg. Photoresist
- **Results**
  - Selectivity : 10
  - Etch rate : 0.5 µm/min
  - Over etch time : 5 min
  - Uniformity : +/- 2%
  - Profile angle : 91º

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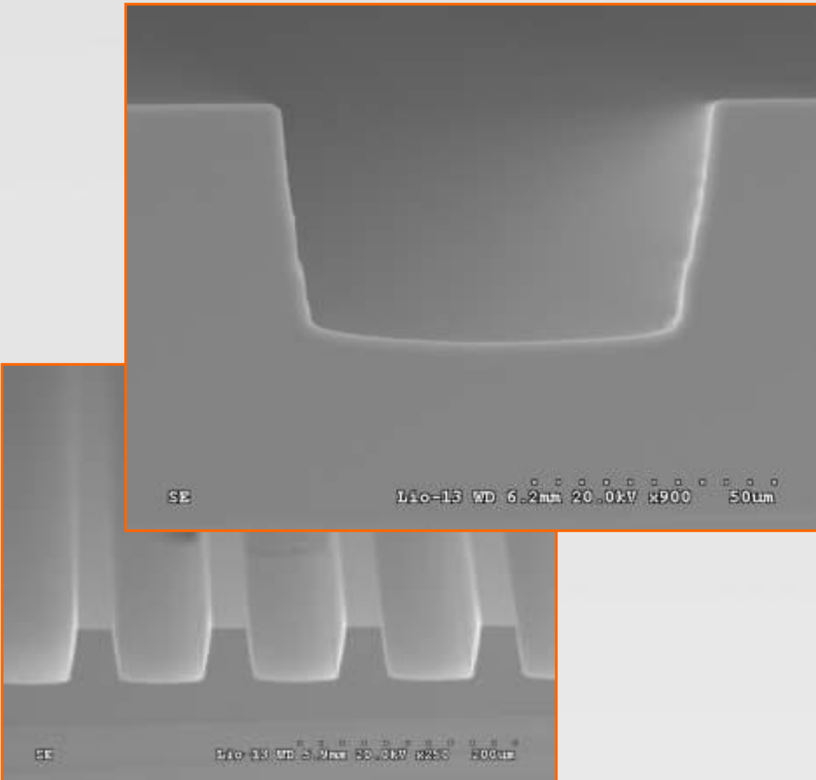
Borosilicate etching



Borosilicate etching
Tapered etch with smooth bottom

- **Conditions**
  - Wafer size : 100 mm
  - Feature width : 70 µm
  - Etch depth : 47 µm
  - Feature shape : Trench
  - Mask : Si
  - Substrate : Borosilicate
- **Results**
  - Etch rate : 0.39 µm/min
  - Selectivity : 18
  - **Slope : 98°**

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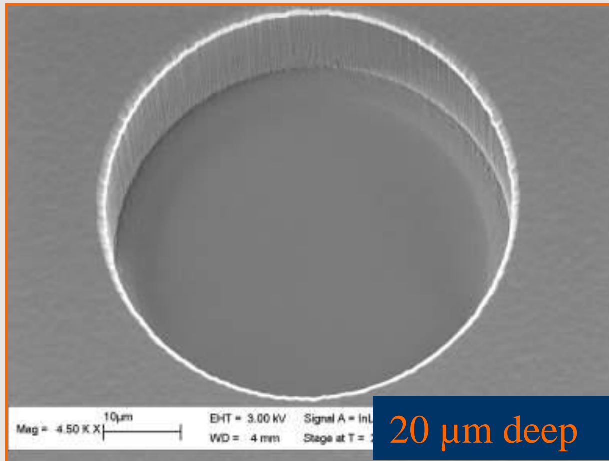
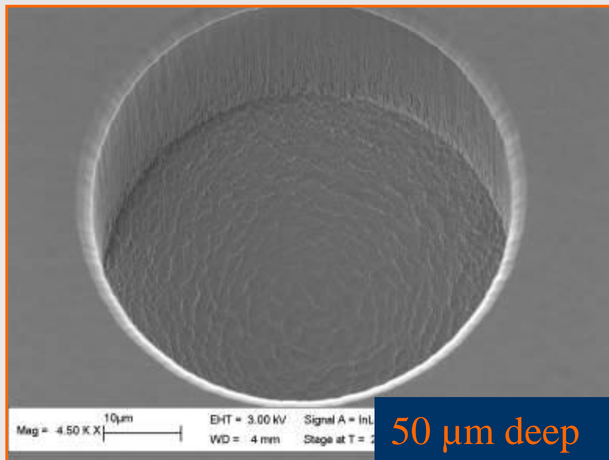
Buried Oxide etch

- **Conditions**
  - Wafer size : 150 mm
  - Feature width : 5 µm
  - Si thickness : 22 µm
  - SiO2 Etch depth : 1.5 µm
  - Feature shape : Trench
  - Mask : PR
  - Substrate : Si

Fused silica etching





- **Conditions**
  - Wafer size : 100 mm
  - Feature width : 50 µm
  - Feature shape : Hole
  - Mask : Si
  - Substrate : Fused Silica
- **Results**
  - **Etch rate : 0.43 µm/min**
  - **Etch depth : 20 µm to 50µm**

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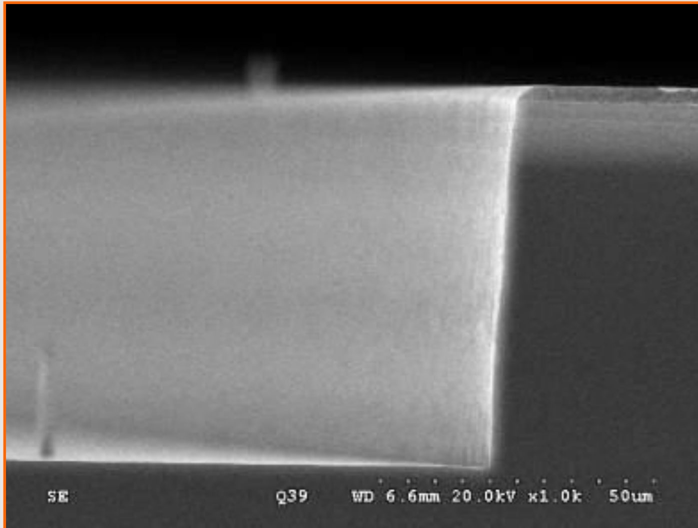
Fused silica etching



Fused Silica
66 µm deep

- **Conditions**
  - Wafer size : 100 mm
  - Feature width : 500 µm
  - Feature shape : Trench
  - Mask : Si
  - Substrate : Fused Silica
- **Results**
  - **Etch rate : 0.44 µm/min**
  - Selectivity : 40
  - **Etch depth : 66 µm**

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www.alcatelmicromachining.com