

# Unique Capabilities of Xenon Difluoride for Failure Analysis

Isotropic etching using xenon difluoride is an ideal solution for removing silicon and other materials for failure analysis. It provides numerous unique advantages and capabilities compared to wet and plasma etching.

## Key Benefits

### Selectivity to a Wide Variety of Materials

There is no other dry isotropic etch that is selective to so many materials.

### Stop on Gate and Trench Oxide

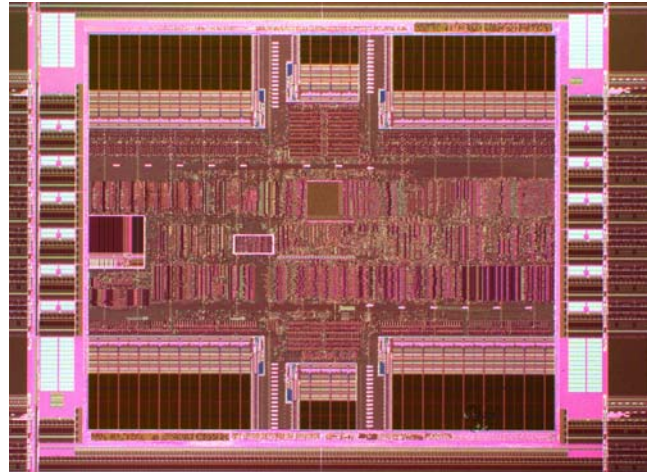
Xenon difluoride has very low attack on  $\text{SiO}_2$  allowing the removal of silicon from the back of non-SOI circuits stopping on the gate and trench oxide.

### Wide Area Backside SOI Removal

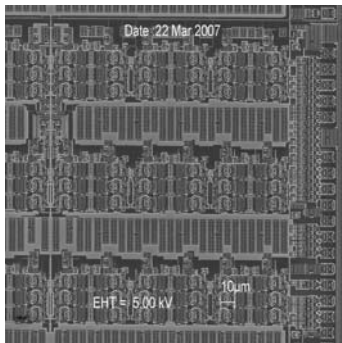
Xenon difluoride low attack on  $\text{SiO}_2$  makes it an ideal solution for exposing large areas on SOI chips.

### Dry Etch

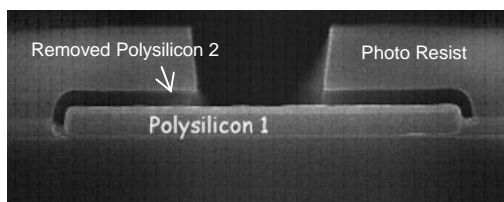
Xenon difluoride is a dry gas phase etch. No liquids or plasmas.



Silicon Removed From Backside of Circuit, Stopping on Gate and Trench Oxide



Silicon Removed From Backside of Processor Implemented in SOI



Polysilicon 2 Removed Without Damaging Underlying Dielectric

## Other Benefits

### Easy Temporary Masks

Xenon difluoride does not attack polymers and other organic materials. As a result, effective temporary masks can be created using photoresist, plastic tape, and even the ink from a permanent marker.

### Etching Through Small Holes and Tight Spaces

Because  $\text{XeF}_2$  is a dry etch there are no surface tension or bubble related problems with etching through small holes or in tight spaces.  $\text{XeF}_2$  has been used to etch through openings as small as 5nm in diameter.

### Silicon Cap Removal

Xenon difluoride can be used to weaken and remove silicon caps frequently used over MEMS devices.

### Remove Other Materials

Xenon difluoride can also be used to etch Mo, Ge, Ta, TaN, Ti, and TiN.



### Xetch e1

- Full Functionality
- Affordable
- Reliable
- Safe
- Easy to Install

