DENTON VACUUM
Enabling Innovation

INFINITY ION BEAM ETCH SOLUTION

TECHNICAL SPECIFICATION SHEET

Patented substrate bias option for low damage etching of sensitive structures used in advanced semiconductor processing.

BENEFITS INCLUDE:

- Low plasma damage etch
- High power etch with helium back-side cooled chuck
- Etch rate selectivity for multiple materials by reactive ion etch and chemically assisted etch
- Precise delayering and end point control with SIMS detector
- Able to accommodate substrate sizes up to 8"

FEATURES	BENEFITS
Bias substrate	Low plasma damage etch
Reactive ion beam etch	Material etch rate selectivity
Chemically assisted ion beam etch	Material etch rate selectivity
Secondary ion mass spectrometer	Precise delayering and end point control
Compatible with front-end options	Easily scalable to meet throughput demands
Automation software	Enhanced process control
Short MTTR/Long MTBF	High system uptime and ease of maintenance

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SYSTEM OVERVIEW

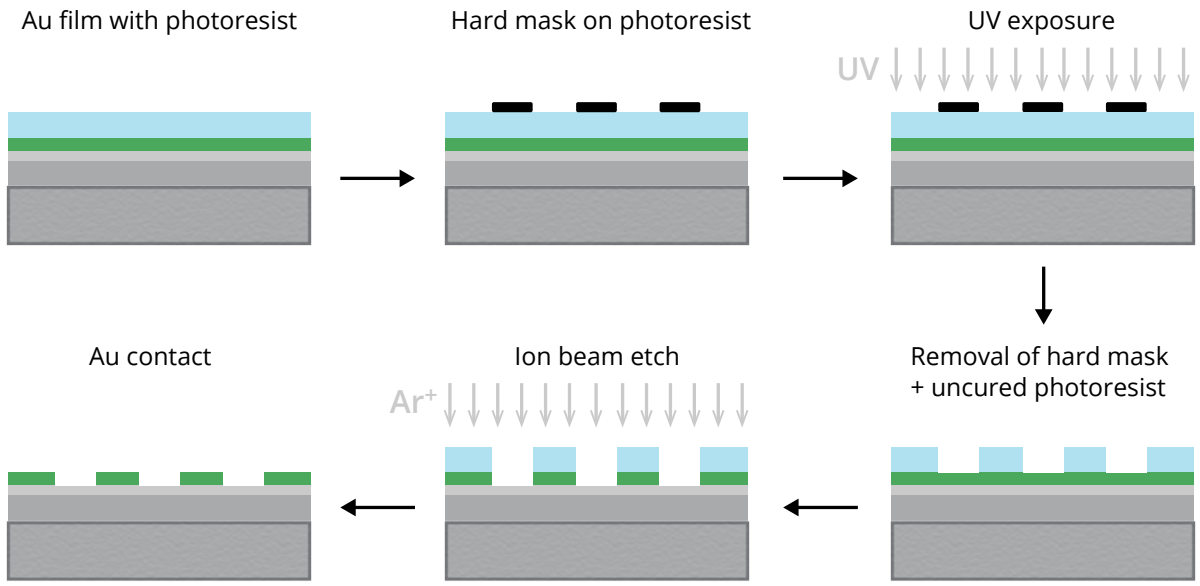
APPLICATIONS:

- Semiconductor process yield improvement with end point control
- Compound semiconductor Au etch
- Process control and chip design assessment
- Patterned etch
- FBAR and SAW device trimming for frequency control

Ion beam etching (IBE) uses an energetic, broad beam collimated and highly directional ion source to physically mill material from a substrate mounted on a rotating fixture with adjustable tilt angle. The ion sources used are gridded ion sources of the Kaufman type and are typically neutralized with an independent electron source. Large and small ion sources are available and capable of uniform etching over areas as large as 9 inches in diameter. The highly collimated, directional ion flux allows for anisotropic etching of any material. The ability to modify the angle of the substrate allows the creation of processes that result in tailored sidewall profiles with minimal sputtered redeposition on overlying masks.

The Infinity IBE is a production-level wafer-etch system, handling wafers up to 200 mm. A highly flexible solution, it is compatible with all Denton's front-end options. The Infinity IBE is suitable for both low-volume R&D or high-volume foundry work.

Ion Beam Etch Process



CONFIGURATION OPTIONS			
MODULE	SIMS	Helium Back-Side Cooled Chuck	Bias Chuck
ETCH	Ion Beam	Reactive Ion Beam	Chemically Assisted Ion Beam
FRONT ENDS	Single Wafer Load Lock	Cassette Load Lock	Cluster Tool Front End

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