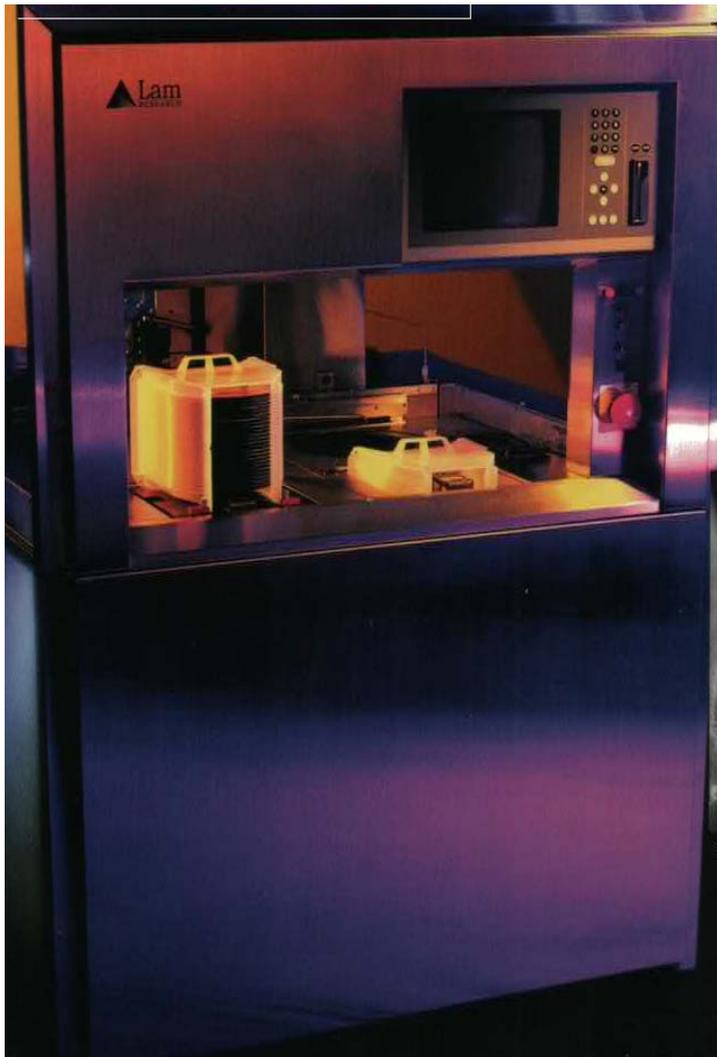


TCP® 9600 Metal Etch



System Reliability

- ◆ Uptime $\geq 85\%$
- ◆ MTTC 12 hours
- ◆ MTBF ≥ 125 hours
- ◆ MTBR ≤ 4 hours

Typical Results

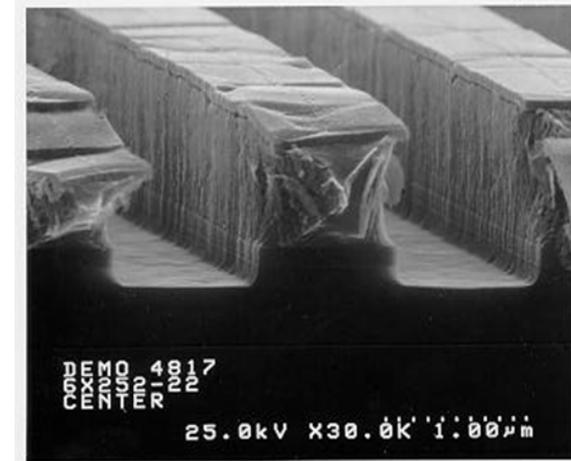
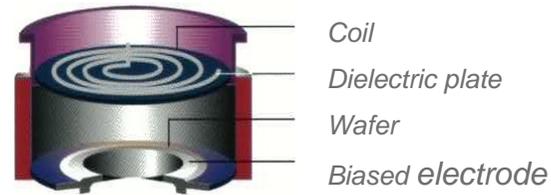
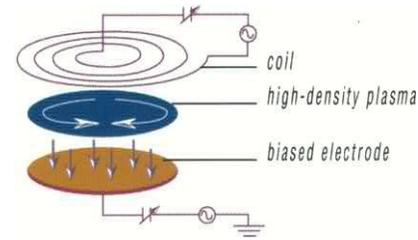
- ◆ Al Etch rate $\geq 8000\text{Å}/\text{min}$
- ◆ Al Uniformity $\pm 15\%$ 3σ
- ◆ Selectivity Al to Resist (ME) $\geq 2.5:1$
- ◆ Selectivity Al to Resist (OE) $\geq 2.0:1$
- ◆ Profile control 87- 90 degrees
- ◆ CD Bias $\leq \pm 10\%$ μm (features $\geq 0.5 \mu\text{m}$)
- ◆ Particles $< 0.1/\text{cm}^2$ at $> 0.2\mu\text{m}$ size
- ◆ Resist strip rate $2\mu\text{m}/\text{min}$ DSQ
- ◆ Resist strip rate $5\mu\text{m}/\text{min}$ microwave

The TCP® 9600 system uses Lam's patented TCP® technology and offers several key benefits for metal etch.

The TCP® technology creates an inductively coupled, high-density plasma directly above the wafer while operating at low pressure.

Independent control of ion generation and ion energy allow etch processes to be optimized, providing excellent etch rates, profile control, and critical dimensions while ensuring minimal damage.

Corrosion prevention commonly exceeding 72 hours is achieved through a passivation process that utilizes photoresist strip and rinse modules. Lam's proprietary downstream quartz (DSQ) strip or microwave module removes photoresist and chlorine trapped in the sidewall matrix. Subsequently, the atmospheric passivation module (APM) rinses the wafer with hot and cold DI water to remove residual chlorine adsorbed on the metal and oxide surfaces.



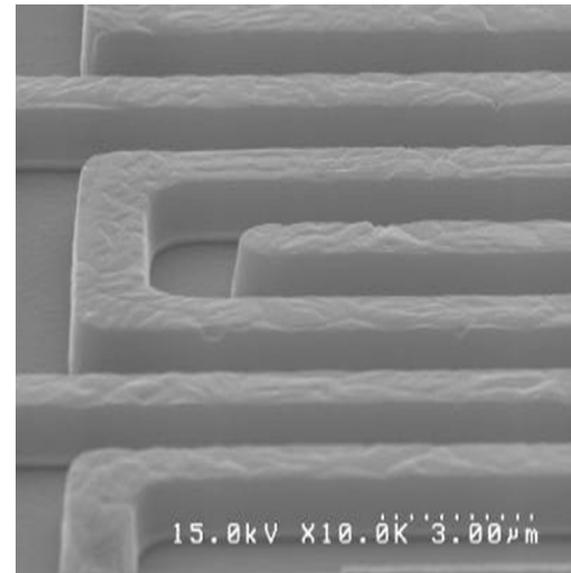
Typical profiles for a Ti/Al-0.5% Cu/TiN/Ti stack

Feature

- ◆ Low pressure operation (1-20mtorr)
- ◆ High density plasma
- ◆ Independent control of ion density
And Ion energy
- ◆ Patented planar coil
- ◆ Simple ,efficient design
- ◆ Rainbow platform

Benefit

- Precise CD control with minimal profile micro-loading
- High etch rates
- Wide process window, minimal micro-loading and damage
- Uniform etch rate and Ion current density
- Ease of maintenance, low cost of ownership
- Production proven ,high reliability



Etched alloy lines, Al-1% Cu, TiW barrier