

TitanKlean® Cu

Advanced post-etch residue removal solution

As pattern geometries become increasingly smaller and more complex, removing the metal hard mask during the post-etch residue removal process becomes more desirable. The major roadblock to implementing this step previously has been the incompatibility of potential mask removal chemistries with other materials that are present. In some cases, these materials are very similar to the hard mask material itself, adding complexity to an already difficult challenge. TitanKlean® Cu was designed to enable this step while also delivering significant cost savings.

TitanKlean Cu formulated solutions provide one-step hard mask removal and post-etch clean and are compatible with relevant exposed thin films materials. In addition to the excellent reliability and yield, these proprietary formulations have specifically been designed to provide significant cost of ownership benefits.

Throughput and consumption benefits are realized through increased hard mask removal rate and the ability to utilize the chemical in recycle mode.



FEATURES & BENEFITS

- Reduced cost of ownership
 - High TiN etch rate leads to reduced process times; less chemistry used per wafer and higher throughput so fewer tools need to be purchased
 - Improved stability of chemistry allows for recycling if desired
- Improved yield
 - Removal of hard mask results in less metallization defects
 - Enhanced residue removal capability
- Operation
 - Designed for operation in all single-wafer tool platforms
 - Standard operating temperature from room temperature to 60°C (140°F)
- High TiN MHM etch rate >175 Å/min at most customers and tunable from ~5 – 250 Å/min
- Compatible with advanced dielectric films down to $K=2.4$
- Low Cu, Co and Ru etch rate, <1 Å/min for all films
- Good post etch residue removal
- Excellent bath life and wafer loading capability

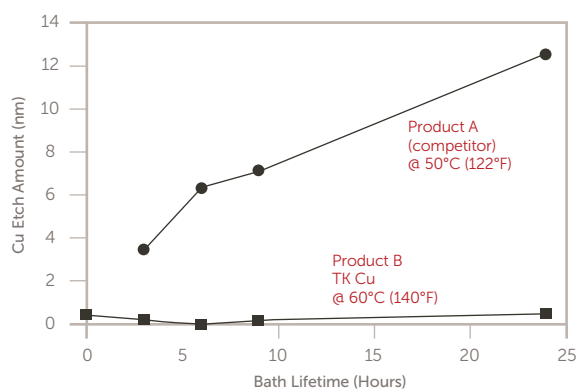
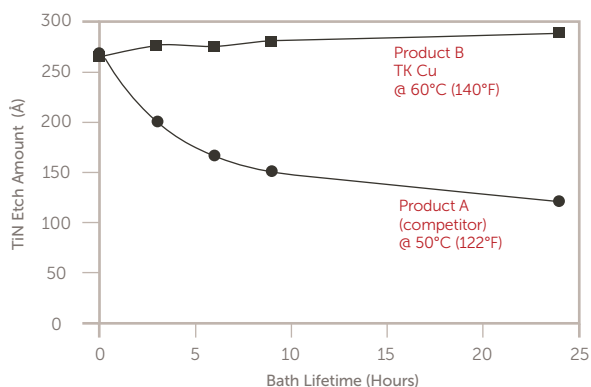
SPECIFICATIONS

Color	Clear, yellow liquid
pH	>13
Flash point	>200°C (392°F)
Density	1.006 g/mL
Viscosity	1.38 cP at 20°C (68°F)
Surface tension	60 dynes/cm

Etch Rate, Å/min, at 50°C (122°F)

Cu	<1
BDIIX	<0.5
K-value shift (K<2.5, ULK dependent)	<5%
Co E/R	0.5–1
Ru E/R	<0.5
TiN E/R	5–250
PETEOS E/R	<0.5
W E/R	>15

PERFORMANCE DATA



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