

RegenSi® 74

An efficient alternative for wafer reclaim/recycle methods

RegenSi® 74 is the next-generation test wafer recycle chemistry specifically formulated to provide a single-step process for removal of complete test metallization schemes. Capable of rapidly removing aluminum and copper stacks, RegenSi 74 can be implemented on all major wet bench platforms (HF compatible) to replace existing two- or three-chemical process steps for efficiency gains. Using RegenSi 74 results in reduced chemical usage, reduced waste volumes and greatly-reduced rinse volumes.

The RegenSi 74 solution maintains core characteristics of the RegenSi family of solutions, especially extremely high selectivity to silicon resulting in rapid film removal with no damage to the underlying silicon (wafer recycle). This minimizes – and in some cases eliminates – the need for expensive post-film strip processing such as CMP or silicon polish (wafer reclaim). RegenSi 74 has also been designed to operate at ambient room temperature. For maximum metal and dielectric wafer recycle/reclaim process efficiency, use RegenSi 74.

FEATURES & BENEFITS

- One chemical process for complete stack removal (metal, barrier, dielectric)
- Ambient room temperature operation
- Minimal silicon surface damage
- Increased uptime (fewer bath changes)
- Compatible with standard HF tank in a wet bench
- 8x reduction in chemical usage per wafer
- Reduced costs for waste and energy

MATERIAL COMPATIBILITY

Testing has shown compatibility with the following materials of construction:

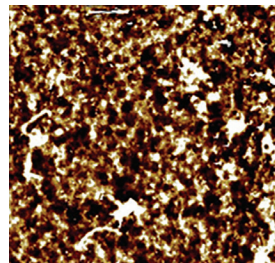
- High Density Polyethylene (HDPE), PFA, PVC, PVDF, Polypropylene (PP), Teflon® (PTFE), Halar.

HANDLING, STORAGE AND PACKAGING

Before using this product, read the MSDS, as well as the RegenSi 74 applications document. RegenSi solutions are available in 1-gallon, 5-gallon and 55-gallon packages.

PROCESS RECOMMENDATIONS

For RegenSi solution applications, customized recipes may be required depending on the system type (wet bench is preferable), the specific test wafers being processed and the customer specification requirements. For metal test wafer recycle, RegenSi 74 needs to mix in-situ with H₂O₂ by 2:1 ratio (RegenSi 74: 30% H₂O₂) during process, requiring the use of a chemical-spiking system function.



Si surface condition after industry standard, multi-chemical process. (AFM measurement – Rms = 1.194 nm)



Si surface condition after RegenSi 74 process. (AFM measurement – Rms = 0.078 nm)

Result

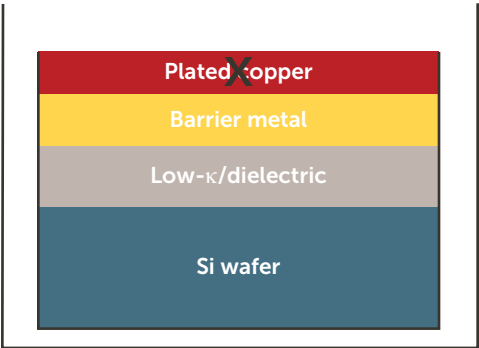
The single-step RegenSi process removes the entire film stack at one time – at room temperature – and leaves a smooth surface ready for re-use.

RegenSi 74 is a formulated chemistry that is designed to save money and time in wafer recycle and reclaim processes by eliminating steps.

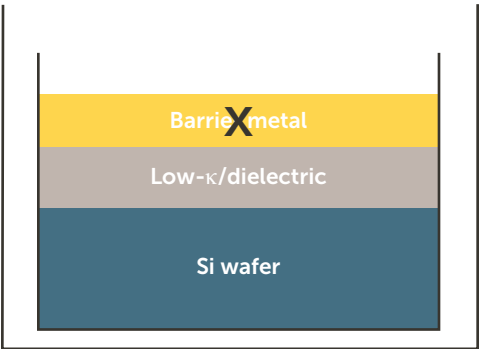
Traditional Method

A traditional reclaim process can require at least three “commodity chemical” process steps:

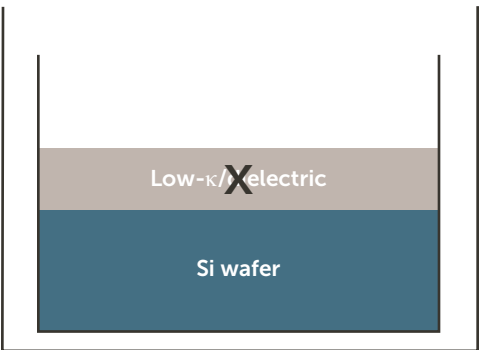
Tank 1 – SPM



Tank 2 – HF/Nitric



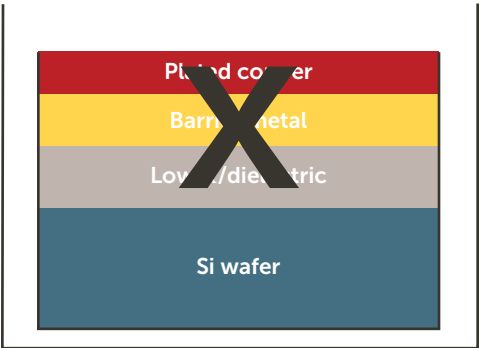
Tank 3 – Dilute HF



RegenSi Process

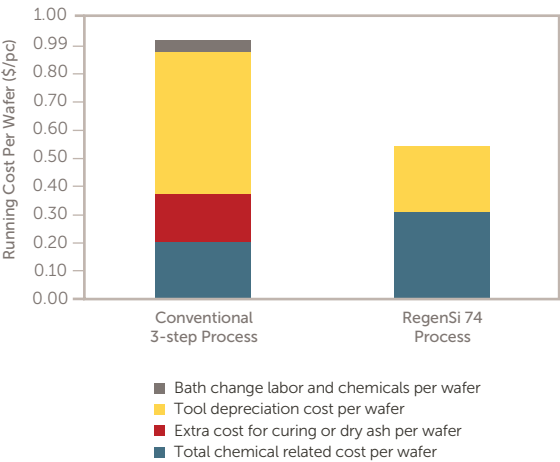
Just one chemical process step is required using specially-formulated RegenSi 74:

Tank 1 – SPM



Using RegenSi 74 can help you save money in your reclaim/recycle program.

RegenSi 74 Recycle vs. Conventional Recycle (cost per wafer)



SPECIFICATIONS

RegenSi® 74 has the ability to remove the majority of commonly used metal and dielectric films.

DETAIL	REGENSI 74
Contains solvents	No
Flashpoint	>100°C (212°F)
Viscosity (25°C [77°F])	1.1 cSt
Suggested process temperature	25°C (77°F)
Bath life	>72 hours
Copper loading	Very high
BD loading	Low
COD	250:1 dilution: 490 ppm
	500:1 dilution: 236 ppm
	1000:1 dilution: 130 ppm

FILM TYPE	ETCH RATE AT ROOM TEMP. (Å/MIN)*
Aurora	>2200
Black Diamond	>600
Coral	>10,000
FSG	>6000
ULK	>1500
TEOS	>3000
Th Ox	>800
Cu	>80,000
Al	>10,000
Ta	>400
Ti	>4000
TiN	>50
TaN	>700
SiN	200
SiCN	0.5

*Etch rate mix ratio is 2:1, RegenSi 74 and H₂O₂ (30%).

FOR MORE INFORMATION

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