

# Etching solutions

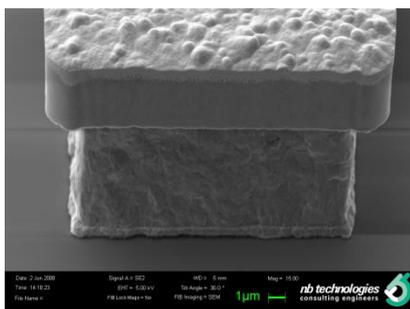
**nb technologies**  
consulting engineers



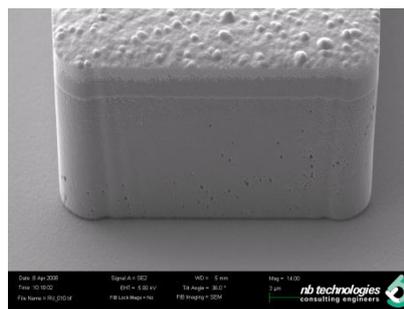
NBT has designed etching chemicals for the removal or patterning of metals, sacrificial layers or seed layers for electroplating. The difference in requirements is whether the seed needs to be **removed after plating** with selectivity to all other materials and least dimension loss, or if the seed needs to be **patterned before plating**, which requires compatibility with masking resists.



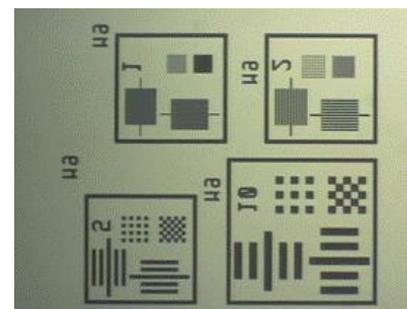
Etchant	Application	Features
<b>Au etch 200</b>	Seed <u>patterning/removal</u>	Non-toxic, <b>cyanide-free</b> , <b>very small undercut</b> , resist compatible, selectivity to many metals and materials like Ni, Cr, Ti, Al, Ta, Pt ; (Cu is etched) ; 50°C
<b>Au etch 300</b>	Bulk etching Seed <u>patterning/removal</u>	Non-toxic <b>iodine-based</b> , easy application, resist compatible, significant undercut, (limited) selectivity to plated metals like Cr, Ti; (Ni and Cu are attacked)
<b>Cr etch 200</b>	Adhesion layer <u>removal</u>	Alkaline solution, RT, good selectivity to many metals like Au, Pt, Ta, Ti, Ni, Cu; (Ag is etched)
<b>Cr etch 210</b>	Adhesion layer <u>patterning</u> (resist mask)	Alkaline solution, <b>compatible with resist for patterning</b> , 40°C, good selectivity to many metals like (like Cr etch 200)
<b>TiW etch 100</b>	Barrier layer <u>removal</u>	<b>Compatible with resist</b> , low undercut, contains fluoride, RT, selectivity to many metals and materials like Au, Ni, Cr, Sn; (Al and Cu with limitation)
<b>TiW etch 200</b>	Barrier layer <u>patterning</u> (resist mask)	<b>Compatible with resist</b> , low undercut, contains fluoride, RT, selectivity to many metals and materials like Au, Cr, Ni ; (Cu is etched)
<b>Cu etch 100</b>	<b>Sacrificial layer removal</b>	Alkaline etchant, compatible with resist for patterning or etching <b>thick Cu layers, high undercut</b> , RT, selective to Ni, Au, Ag, Al, Sn, Ti, Ta, Cr, Si, Si <sub>2</sub> N <sub>4</sub> , SiO <sub>2</sub>
<b>Cu etch 150</b>	Seed <u>patterning/removal</u>	Alkaline etchant, compatible with resist (e.g. <b>Cu seed layers</b> ) selective to Ni, Au, Ag, Al, Sn, Ti, Ta, Cr, Si, Si <sub>2</sub> N <sub>4</sub> , SiO <sub>2</sub>
<b>Cu etch 200 UBM</b>	Seed <u>patterning</u> (resist mask)	<b>Patterning of thin Cu layers, low undercut</b> , compatible with resist, RT, selective to Au, Ni, Cr, Ti, Ta, Sn, Al, Pt)
<b>AX 100</b>	<b>Activator</b> for plating of <b>nickel on nickel</b>	Acidic pre-dip solution, 40°C application, improves significantly adhesion, where nickel is plated on nickel



**Etching TiW after plating**  
Plated Cu/Ni/Au on TiW/Cu seed  
No undercut of TiW  
Least dimension loss of Cu (~1µm)



**Etching Cu seed after plating**  
Plated Cu/Ni/Au on TiW/Cu seed  
No dimension loss of plated Cu



**Patterning before plating; Cr/Au seed from the backside of glass wafer;**  
least undercut, 1µm feature resolved

January 2021

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