Area of use

Cu-etch-100 is an alkaline etchant for Cu and is used for the wet-chemical removal of Cu layers with selectivity to metals like Ni, Au, Cr, Sn, Ti. Common areas of use for semiconductor fabrication or microsystem technology.

Advantages and Requirement Profile

Cu-etch-100 offers selectivity to numerous materials, high etching rate or undercut for the removal of Cu topped with other materials. Thus Cu-etch-100 is very suitable for etching Cu sacrificial layers. Cu-etch-100 is available in different purity grades. Though alkaline, the etching solution is compatible with resist and can be used at room temperature.

Cu-etch-100 fits to the following requirement profile:

- High etching rate and rate of underetching with Cu as sacrificial layer
- Selectivity to many materials, e.g. common metals used in electroplating industry
- Available in different purity grades
- Compatible to resist masking
- Usage at room temperature

Inteded Use

- Usable for manual process, tank or etching equipment
- Use in laboratory or production environment only
- Use for commercial application only

Selectivity

Cu-etch-100 is compatible/etches selective to following materials:

- Resists: common Novolak as masking resist (e.g. AZ® Photoresist)
- Metals: no attack on Cr, Au, Pt, Sn, Ni, Ti, Ta; TiW, Ag, Zn is attacked
- Semiconductor materials: Si, SiO2, Si3N4

(further information an request)

Etching rate / capacity

Under normal condition, the etching rate is around 3 to 3.5µm/min (at RT).
The mixed etching solution is not stable over time (mixture of two components), but can be used multiple times depending on the requirements of application. It is recommended to dispose the solution at the latest, when the etching rate has changed by 20%.

Order number / Article number/ Shipping form

Cu-etch-100 is shipped in two components.
As a standard, all compounds used are level „extra pure“.

Order number: Article number + Container-Code

	Article number	Container-Code				
		1l	2,5l	5l	10l	20l
Cu-etch-100 Unit A	102100-41	D	E	F	G	H
Cu-etch-100 Unit B	102100-42	D	E	F	-	-

On request: - Certificate of Analysis with individual requirements regarding elements
- etching solution in other purity grade or special grade regarding specific elements

Mixture

The etching solution has to be mixed as follows:

6 parts Unit A + 4 parts Unit B

The mixed etching solution is not stable over time (mixture of two components), but can be used multiple times depending on the requirements of application. It is recommended to dispose the solution at the latest, when the etching rate has changed by 20%.

Etching conditions

Temperature:	RT (21°C), maximum 35°C (risk of decomposition)
Tank:	Tank for batch process, Petri dish for manual application
Agitation:	medium; Circulation; stirring bar; autom./ man. agitation of work piece
Etching rate:	3.0 to 3.5µm per minute (at RTC)
Pretreatment:	where applicable descum / oxygen plasma for improving the wetting properties of resist or metal mask (no wetting agents needed)

Etching result / inspection

The completed removal of the Cu can be identified by visual observation. There should be no visible residue of Cu, which should be verified by inspections with optical microscope.

General application notes

Pretreatment
Substrates should be pretreated in oxygen plasma, in order to remove any potential organic residues and to improve the wetting properties of the solution on resist masks. The surface is getting hydrophilic and no extra wetting agents are required.

Etching process

During the etching process, sufficient agitation of the solution or of the substrate is needed. If used in manual processing, the etching time required can be identified by observing a color changeover in the open etching areas and. After visual qualification the etching should be continued for 10% bis 15% of the time elapsed, in order to assure the removal of any residues. In case of application for sacrificial layer removal, the etching time is strongly dependant of the structure geometry and thickness of the Cu layer, so that the etching time needs to evaluated individually.

Post treatment

Thorough cleaning with DI-water / quick dump
Rinsing dryer or manually drying with nitrogen nozzle

Know issues / trouble shooting

Inhomogeneous etching result / incompleted etching

- Poor wetting / no descum or plasma executed
- Etching solution /etching capacity is consumed
- Mixture of Unit A and Unit B not in correct ratio
- Not enough agitation

Poor resolution / high undercut

- Poor adhesion of resist
- Excessive etching time

Safety and disposal notes

The mixture contains sodium chlorite and is classified as dangerous according to Regulation (EC) No. 1272/2008.
Refer to the safety and handling recommendations of the material safety datasheet before use.

Do not empty into drains or the aquatic environment. Collect used or unused solution in containers and perform waste disposal according to official state regulations.
Cleaned containers may be recycled.

Technical Support

NB Technologies GmbH
Fahrenheitstr. 1, 28259 Bremen
Tel.: 0421 2445810 FAX.: 0421 22379787
Email: info@nb-technologies.de
Web: www.nb.technologies.eu