Au-etch-200
for semiconductor and microsystem technology
Technical Datasheet and Application Notes

Area of use
Au-etch-200 is a non-hazardous, cyanide-free, slightly alkaline etchant for Au. The etchant is used for the wet-chemical patterning of Au layers with selectivity to metals like Pt, Ni, Cr, Ti, Al. Common areas of use for semiconductor fabrication or microsystem technology.

Advantages and Requirement Profile
Au-etch-200 is compatible with common resist, shows very low undercut (in the dimension of the layer thickness) under a resist mask pattern and offers selectivity to numerous materials.
Au-etch-200 is very useful for the patterning of Au layers using resist mask patterns or for the selective removal of seed layers after plating process steps, where plated feature must not be attacked by etchants. Au-etch-200 is available in different purity grades. The etchant is not hazardous and easy to handle.

Au-etch-200 fits to the following requirement profile:
- Low undercut (in the range of the layer thickness), minimum feature size < 1µm
- Selectivity to many materials, e.g. common metals used in electroplating industry
- Available in different purity grades
- Compatible to resist masking
- Not hazardous substance and easy to handle

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

Selectivity
Au-etch-200 is compatible/etches selective to following materials:
- Resists: common Novolak as masking resist (e.g. AZ® Photoresist)
- Metals: no attack on Cr, Pt, Ni, Ti, Ta, Al; Cu is attacked
- Semiconductor materials: Si, SiO2, Si3N4
  (further information on request)

Etching rate / capacity
Under normal condition, the etching rate is around 40nm/min (at 50°C). The mixed etching solution is stable over time and 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

Au-etch-200 is shipped ready for use. As a standard, all compounds used are level „extra pure“.

Order number: Article number + Container-Code

<table>
<thead>
<tr>
<th>Article number</th>
<th>1l</th>
<th>2.5l</th>
<th>5l</th>
<th>10l</th>
<th>20l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Au-etch-200</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
</tr>
</tbody>
</table>

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

Mixture

Au-etch-200:
The solution is shipped ready for use.

Etching conditions

Temperature: 50°C
Tank: Tank for batch process, Petri dish for manual application
Agitation: medium;
Circulation; stirring bar; autom./ man. agitation of work piece
Etching rate: 40nm per minute (at 50°C)
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 Au can be identified by visual observation. There should be no visible residue of Au, 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.
Post treatment
Thorough cleaning with DI-water / quick dump
Rinsing dryer or manually drying with nitrogen nozzle

Know issues / trouble shooting
Inhomogeneous etching result / incompletely etched
- Poor wetting / no desum or plasma executed
- Etching solution / etching capacity is consumed
- Not enough agitation

Poor resolution / high undercut
- Poor adhesion of resist
- Excessive etching time

PRODUCT STABILITY NOTES
In order to prolong the usability period of the product after opening of the bottle, the bottle should be flooded with nitrogen when closed again. Air atmosphere may result in accelerated oxidation of certain compounds.

Safety and disposal notes
This mixture is not 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