

### **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

### **Inteded 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<sup>®</sup> Photoresist)
  - Metals: no attack on Cr, Pt, Ni, Ti, Ta, Al; Cu is attacked
  - Semiconductor materials: Si, SiO<sub>2</sub>, Si<sub>3</sub>N<sub>4</sub>
- (further information an 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

	Article number	Container-Code				
		1l	2,5l	5l	10l	20l
Au-etch-200 (ready-to-use)	103200-40	D	E	F	G	H

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 / incompleted etching

- Poor wetting / no descum 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

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