

Safety note

The etching solution contains ammonium fluoride. Even if the concentration is rather low and the solution is classified according to present regulations, solutions containing fluorides have to be handled with maximum caution due to poisonous hazardous impact.

Comply with hazard information and safety recommendations of the material safety datasheet.

Area of Use

TiW-etch-100 is applied as etchant for titanium-for the wet-chemical patterning of TiW-layers with selectivity to metals like Au, Pt, Ni, Cr, Sn. Usual applications are found in the semiconductor or microsystem technology field for etching adhesion layers or diffusion barriers.

Advantages and Requirement Profile

TiW-etch-100 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.

TiW-etch-100 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.

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

- Low undercut (in the range of the layer thickness), minimum feature size < 1 µm
- Selectivity to many materials, e.g. common metals used in electroplating industry
- Compatible to resist masking

Inteded Use

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

Selectivity

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

- Resists: common Novolak as masking resist (e.g. AZ[®] Photoresist)
 - Metals: no attack on Au, Cr, Ni, Sn; Cu impact at prolonged exposition
 - Semiconductor materials: Si, SiO₂, Si₃N₄
- (further information on request)

Etching rate / capacity

Under normal condition, the etching rate is around 1nm/sec (at room temperature). 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

Tiw-etch-100 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
TiW-etch-100 (ready-to-use)	104100-40	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

TiW-etch-100:
The solution is shipped ready for use.

Etching conditions

Temperature: Room temperature
Tank: Tank for batch process, Petri dish for manual application
Agitation: medium;
Circulation; stirring bar; autom./ man. agitation of work piece
Etching rate: 1nm per second (at room temperature)
Pretreatment: where applicable descum / oxygen plasma for improving the wetting properties of resist or metal mask (no wetting agents needed)
Post treatment: A thin residue of tungsten oxide remains on the surface. This can be removed with a short dip (15 to 30seconds) in alkaline solutions. As an alternative, the residue can be removed with a short dip (max 2 min) in hydrogen peroxide (H₂O₂ 30%).

Etching result / inspection

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

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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

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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

Safety and disposal notes

The mixture contains ammonium fluoride. 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. Treat contaminated containers like the substance itself. Cleaned containers may be recycled.

Technischer Support

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