

Aluminum Etch Type A

Description

Standard aluminum etchant for use on silicon devices and other microelectronic applications. Will not attack SiO₂ or Si₃N₄. This also offers high resolution with minimal undercutting.

Components

Phosphoric Acid	40-80%
Acetic Acid	3-20%
Nitric Acid	1- 5 %

Manufacturer Contact Information

TRANSENE COMPANY, INC.
DANVERS INDUSTRIAL PARK
10 ELECTRONICS AVENUE
DANVERS, MA 01923
(978) 777-7860

Operating Conditions

This material can be used at room temperature or heated to the vendor recommended temperature of 40°C. Stirring of the solution leads to higher and more repeatable etch rates. The solution may be used in either plastic or glass containers at room temperature, but it should only be used in glass when heating.

Notes

- The rate of etching becomes more uniform and higher when agitated.
- Recommended heating temperature is 40°C

Etch Rates (nm/min)

	Unstirred	Stirred	Stirred (40°C)
Aluminum	12-40	20-75	262-680
Chromium	0	0	0
Cobalt	NT	NT	NT
Copper	700-1000	>1000	
Germanium	NT	7	15 - 25
Gold	0	0	0
Molybdenum	>100	>100	>100
Nickel	ND	2-10	470-760
Palladium	0	0	0
Silver			
Tantalum	0	0	0
Titanium	0	0	0
Zirconium	0	0	0
Silicon Oxide			
- Thermal	NT	NT	NT
- PECVD Silane	NT	NT	NT
- PECVD TEOS	NT	NT	NT
- LPCVD TEOS	NT	NT	NT
- LTO	NT	NT	NT
Silicon Nitride			
- LPCVD	NT	NT	NT
- LPCVD low stress	NT	NT	NT
- PECVD	NT	NT	NT
- PECVD low stress	NT	NT	NT
Polysilicon			
- undoped	NT	NT	NT
- n+	NT	NT	NT
- p+	NT	NT	NT
- PECVD amorphous	NT	NT	NT

NT – Not Tested

Copper Etch 100/200

Description

This is a standard copper etchant. It is designed to be used for circuit boards and has a very rapid etch rate to copper so be wary when doing fine details.

Components

Ferric Chloride	30%
Hydrochloric Acid	3-4%

Manufacturer Contact Information

TRANSENE COMPANY, INC.
DANVERS INDUSTRIAL PARK
10 ELECTRONICS AVENUE
DANVERS, MA 01923
(978) 777-7860

Operating Conditions

The vendor recommend operating temperature is 50°C although the room temperature etch rate of this material is very high and therefore heating is generally not necessary. Stirring of the solution leads to higher and more repeatable etch rates. The solution may be used in either plastic or glass containers at room temperature, but it should only be used in glass when heating. The material may be diluted with water to reduce the etch rate.

Notes

- The rate of etching becomes more uniform and higher when agitated.
- Recommended heating temperature is 50°C
- Some materials had inconsistent etching with fast etch rates in some areas and zero etching in others (see pictures).

Etch Rates (nm/min)

	Unstirred	Stirred	Stirred Diluted 10:1	Stirred Diluted 50:1
Aluminum				
Chromium	0	0	0	0
Cobalt	NT	NT	NT	NT
Copper				
Germanium	150-250	300-400	100-400	75-100
Gold	0	0	0	0
Molybdenum	234	178	55-75	40-70
Nickel				
Palladium	178	>200	10-30	0
Silver				
Tantalum	0	0	0	0
Titanium	0	0	0	0
Zirconium	0	0	0	0
Silicon Oxide				
- Thermal	NT	NT	NT	NT
- PECVD Silane	NT	NT	NT	NT
- PECVD TEOS	NT	NT	NT	NT
- LPCVD TEOS	NT	NT	NT	NT
- LTO	NT	NT	NT	NT
Silicon Nitride				
- LPCVD	NT	NT	NT	NT
- LPCVD low stress	NT	NT	NT	NT
- PECVD	NT	NT	NT	NT
- PECVD low stress	NT	NT	NT	NT
Polysilicon				
- undoped	NT	NT	NT	NT
- n+	NT	NT	NT	NT
- p+	NT	NT	NT	NT
- PECVD amorphous	NT	NT	NT	NT

1 – Inconsistent etching (see picture 1)

2 – Possible deposits created on top of film (see picture 2)

NT – Not Tested

ND – Not Determined

CR-14 Chrome Etch

Description

Common photomask etch because it does not etch photoresist or oxide.

Components

Ceric Ammonium Nitrate 22%
Acetic Acid 8%

Manufacturer Contact Information

TRANSENE COMPANY, INC.
DANVERS INDUSTRIAL PARK
10 ELECTRONICS AVENUE
DANVERS, MA 01923
(978) 777-7860

Operating Conditions

This material can be used at room temperature. The vendor recommended temperature of 21°C. Stirring of the solution leads to higher and more repeatable etch rates. The solution may be used in either plastic or glass containers at room temperature, but it should only be used in glass when heating. CR-14 also has a short shelf life and the etch rate will decrease with time.

Notes

- The rate of etching becomes more uniform and higher when agitated.
- Recommended heating temperature is 21°C
- Short shelf life

Etch Rates (nm/min)

	Unstirred	Stirred	
Aluminum			
Chromium	15-35	75-80	
Cobalt	NT	NT	
Copper			
Germanium	>450	>450	
Gold	0	0	
Molybdenum	>160	>160	
Nickel			
Palladium	0	0	
Silver	0	0	
Tantalum	0	0	
Titanium	0	0	
Zirconium	0	0	
Silicon Oxide			
- Thermal	NT	NT	
- PECVD Silane	NT	NT	
- PECVD TEOS	NT	NT	
- LPCVD TEOS	NT	NT	
- LTO	NT	NT	
Silicon Nitride			
- LPCVD	NT	NT	
- LPCVD low stress	NT	NT	
- PECVD	NT	NT	
- PECVD low stress	NT	NT	
Polysilicon			
- undoped	NT	NT	
- n+	NT	NT	
- p+	NT	NT	
- PECVD amorphous	NT	NT	

Gold Etch: TFA

Description

This is used to help produce thin film circuits. The gold etch is GaAs and Ni compatible and can be used with positive or negative photoresist.

Components

Potassium Iodide	20-40%
Iodine Complex	1-10%

Manufacturer Contact Information

TRANSENE COMPANY, INC.
DANVERS INDUSTRIAL PARK
10 ELECTRONICS AVENUE
DANVERS, MA 01923
(978) 777-7860

Operating Conditions

This material can be used at room temperature. The vendor recommended temperature of 27°C. Stirring of the solution leads to higher and more repeatable etch rates. The solution may be used in either plastic or glass containers at room temperature, but it should only be used in glass when heating.

Notes

- The rate of etching becomes more uniform and higher when agitated.
- Recommended heating temperature is 27°C

Etch Rates (nm/min)

	Unstirred	Stirred	Stirred (27°C)
Aluminum	0	0	
Chromium	0	0	
Cobalt	NT	NT	
Copper	Growth	Growth	
Germanium	25-30		
Gold	200-250	>600	
Molybdenum	0	0	
Nickel			
Palladium	ND ¹	ND ¹	
Silver			
Tantalum	0	0	
Titanium	0	0	
Zirconium	0	0	
Silicon Oxide			
- Thermal	NT	NT	NT
- PECVD Silane	NT	NT	NT
- PECVD TEOS	NT	NT	NT
- LPCVD TEOS	NT	NT	NT
- LTO	NT	NT	NT
Silicon Nitride			
- LPCVD	NT	NT	NT
- LPCVD low stress	NT	NT	NT
- PECVD	NT	NT	NT
- PECVD low stress	NT	NT	NT
Polysilicon			
- undoped	NT	NT	NT
- n+	NT	NT	NT
- p+	NT	NT	NT
- PECVD amorphous	NT	NT	NT