



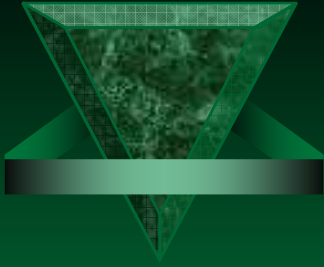
Vis-U-Etch™ 7

The Leader

In

**Cupric Chloride
Regeneration**

**For High Quality, Low Cost
And Environmental Safety**



Highest Quality From ANY Etcher

Home

Quality

Environment
Safety

Speed

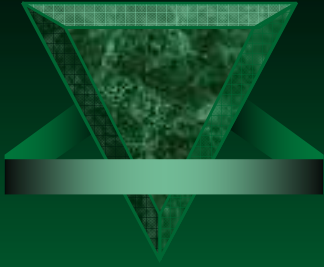
Controller

Operation

Customer
List

Contact
Info

- ◆ Light transmission controls etchant with virtually **NO FREE ACID**.
- ◆ Eliminating free acid allows the **MOST STABLE ETCHANT** because there are no sudden releases of chlorine gas which cause variations in etch rate and etch factor.



Most Environmentally Friendly

- ◆ **NO OFFENSIVE HYDROCHLORIC ACID OR CHLORINE GAS ODORS** from the etcher while operating. Employees love it!
- ◆ **ALL EQUIPMENT IN THE ETCH ROOM LASTS LONGER** without the corrosive atmosphere present with other systems.

Home

Quality

Environment
Safety

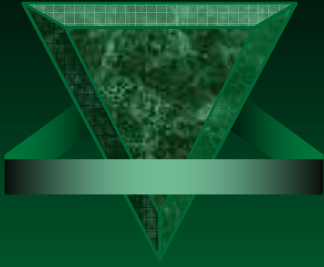
Speed

Controller

Operation

Customer
List

Contact
Info



Highest Level Of Safety

- ◆ Sophisticated **INPUT CHEMICAL FAILURE ALARM SYSTEM** warns of equipment malfunction and shuts down chemical input.

Home

Quality

Environment
Safety

Running
Cost

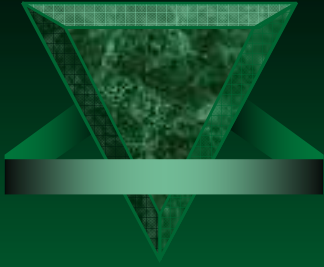
Speed

Controller

Operation

Customer
List

Contact
Info



Low Operating Cost

- ◆ Eliminating free acid provides the **MOST EFFICIENT** use of chemicals.
- ◆ Up to **60% LESS WASTE** generated through higher copper concentration in etchant.
- ◆ No regular calibration, maintenance and no conductivity probes to change
- ◆ Higher % LME copper price for spent etchant

Home

Quality

Environment
Safety

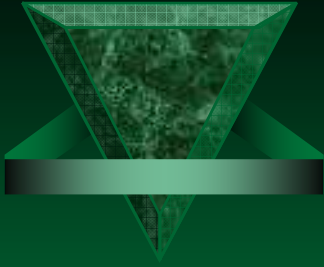
Speed

Controller

Operation

Customer
List

Contact
Info



Proven Technology

- ◆ The **Vis-U-Etch™** has been installed in well **OVER 200 LOCATIONS** world-wide.
- ◆ **OVER 97% RETENTION RATE** for all systems sold.

Home

Quality

Environment
Safety

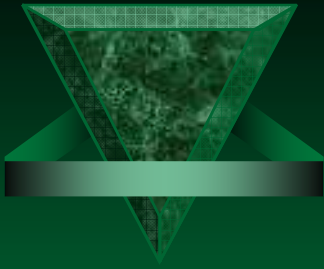
Speed

Controller

Operation

Customer
List

Contact
Info



Vis-U-Etch™ 7 Partial Customer List

Accudyne
Accurate Circuit Engineering
ACE Electronics Co.
Action Computer Products
Advanced Electronics
AKA (Slovenia)
Aspocomp (Finland)
Bartlett Manufacturing
Cal-Flex
Chemitallic (Denmark)
Circuit Systems Inc.
CoGRA (Sweden)
Crown Circuits
DaeDuck Electronics
Debora Electronics
Dong-A Precision Co.
Dynacircuits
Express Circuits (UK)
Electrotryck (Sweden)
Elco (Italy)
Future Technology
Graphic Electronic (UK)
Intec (Slovenia)
Invotec (UK)
ILFA (Germany)
L.E. Flex Circuits
LG Electronics
Lintek
Marcel Electronics International
MERLIN (UK)
M-Flex (China)
M-Flex (Anaheim)

Motorola
Multek (Minnesota)
Multi Circuit
Narae Electronic Co.
New Star Electronics
Nippon Chemical Denshi, Inc.
Omni Circuits
PCI / Gomtech Electronics
Pioneer Circuits
Possehl Besi Electronics
Prime Technologies
Printca (Denmark)
Printed Circuits Unlimited
Pro-Tech
Pycon
Red Board
Rock Industries
Rogers Corp.
Saehan Electronics Co.
Samsung
SDC Circuits
Stevenage (UK)
Somacis (Italy)
SungWoo Electronics
Technomaster (Italy)
Technoflex (UK)
Thales (Holland)
TS Letterplatten (Germany)
Tyco (California)
UltraPrint (Finland)
Würth (Germany)
Winonics (Fullerton)
Yufu Electronics

Home

Quality

Environment
Safety

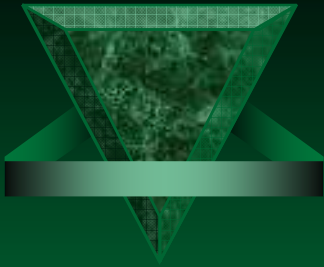
Speed

Controller

Operation

Customer
List

Contact
Info



Quality...

Home

Quality

Environment
Safety

Speed

Controller

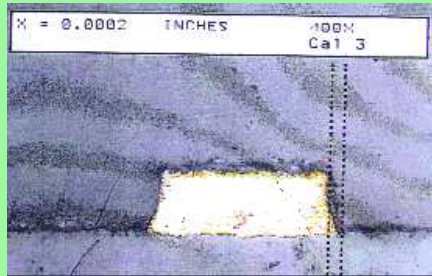
Operation

Customer
List

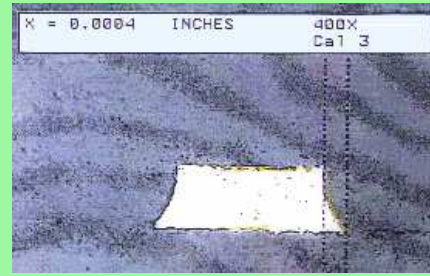
Contact
Info

Cross-Section Comparisons

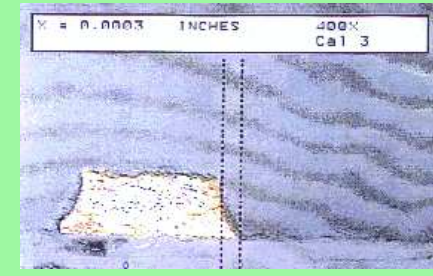
The following are actual cross-section photos showing the affect of acid normality on etching using three different controllers. (See table for parameters)



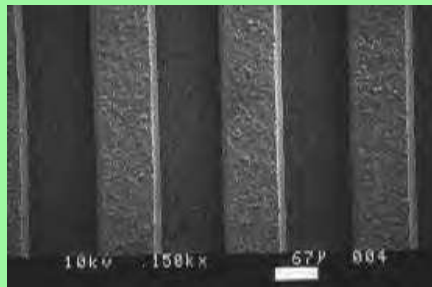
Vis-U-Etch



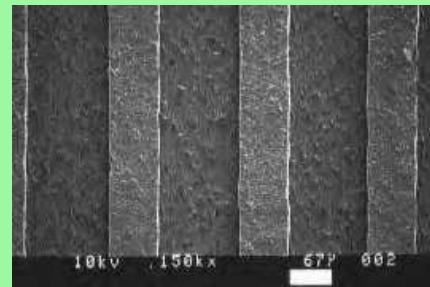
ORP/Normality Controller,
Sodium Chlorate Based Oxidizer



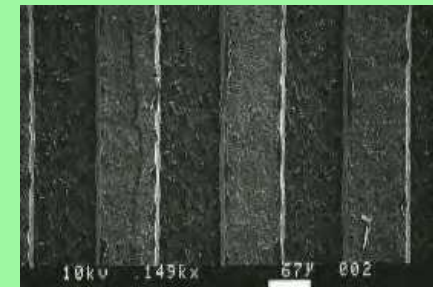
ORP/Normality Controller,
Hydrogen Peroxide Based Oxidizer



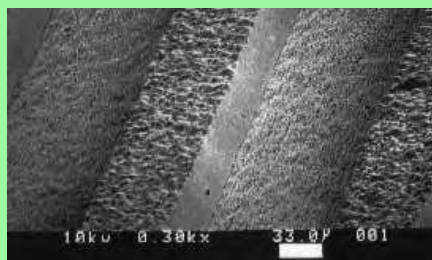
Vis-U-Etch



ORP/Normality Controller,
Sodium Chlorate Based Oxidizer



ORP/Normality Controller,
Hydrogen Peroxide Based Oxidizer



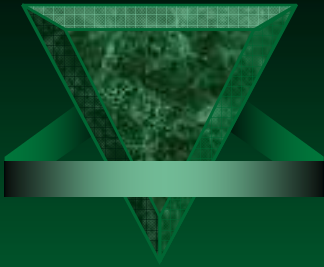
Vis-U-Etch



ORP/Normality Controller,
Sodium Chlorate Based Oxidizer



ORP/Normality Controller,
Hydrogen Peroxide Based Oxidizer



Quality...

Home

Quality

Environment
Safety

Speed

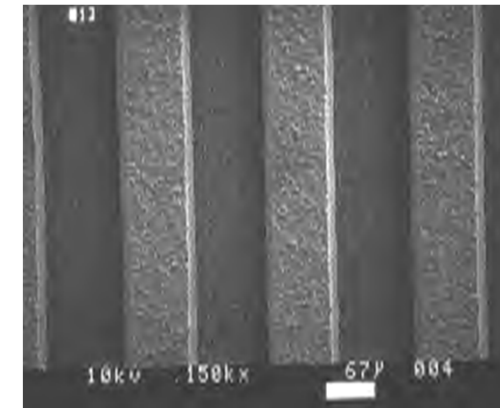
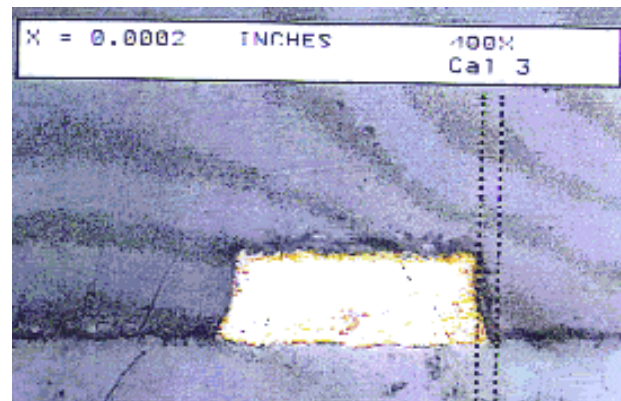
Controller

Operation

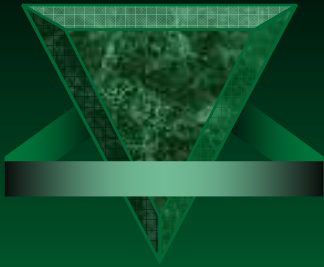
Customer
List

Contact
Info

Unsurpassed Etching Quality...



- ◆ Because there is virtually no free acid
 - The finest lines are possible from any etcher due to minimal acid undercut.
 - The most stable etchant is guaranteed yielding the most consistent quality.
 - The entire etch room environment is less corrosive, safer and more productive.



Quality...

Home

Quality

Environment
Safety

Speed

Controller

Operation

Customer
List

Contact
Info

High Acid vs. Zero Acid

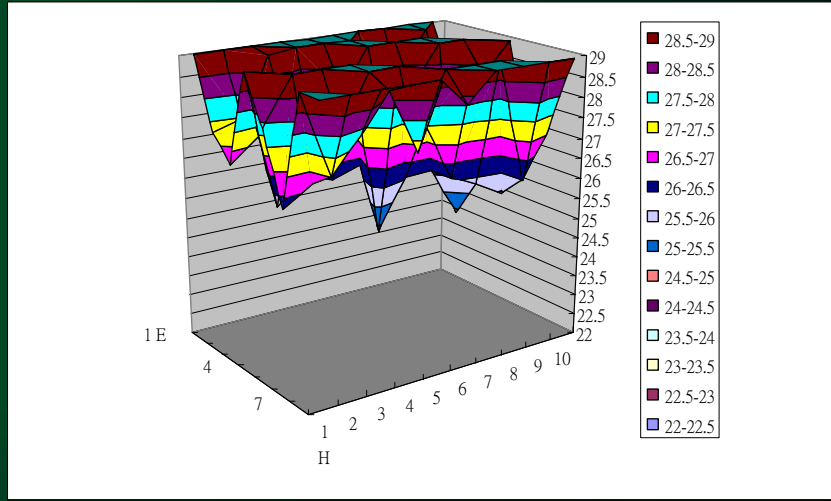


Figure 1 - Etching Variation @2N (In Microns)

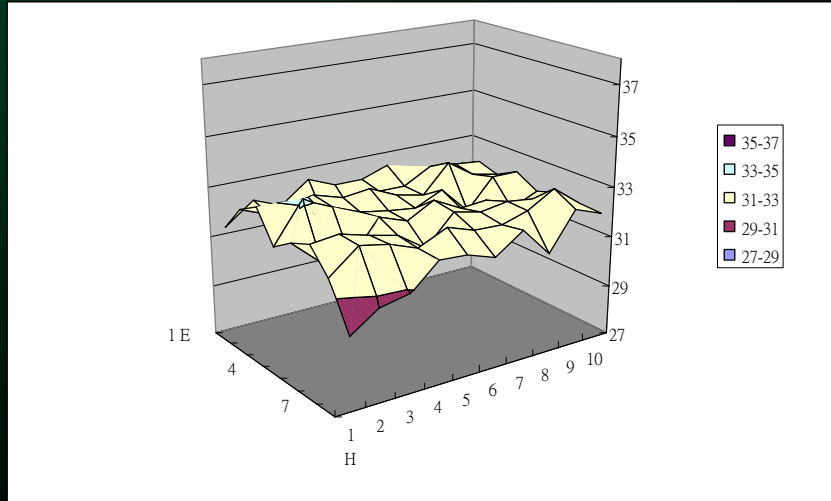
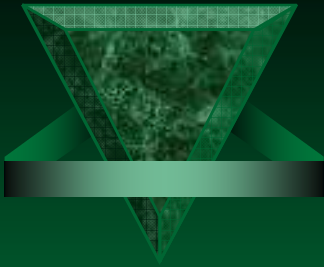


Figure 2 - Etching Variation @0N (In Microns)



Quality...

Home

Quality

Environment
Safety

Speed

Controller

Operation

Customer
List

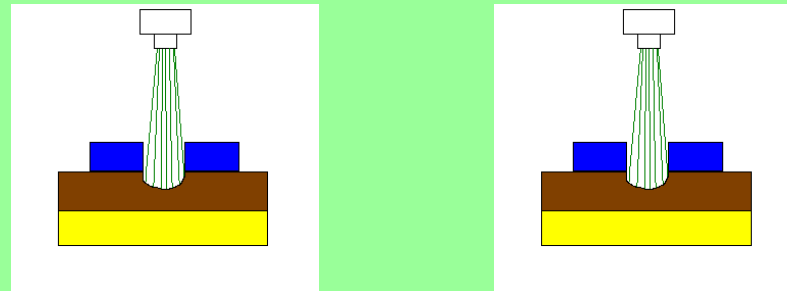
Contact
Info

Zero-Free Acid* Vis-U-Etch™ 7 vs. High Acid

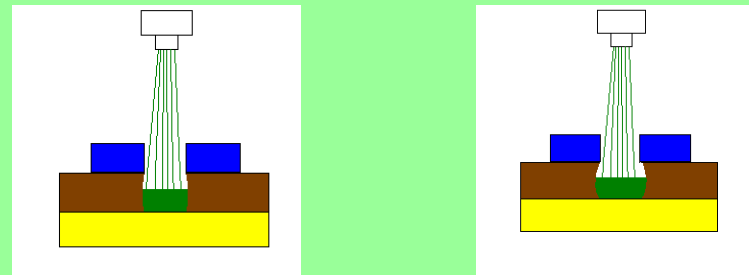
Normality/O.R.P.



Both panels start the same...

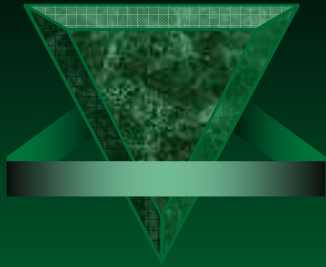


...Etching begins...



...BUT without free acid, straighter side-walls and reduced undercut are guaranteed. Only the Vis-U-Etch™ 7 using light transmission can deliver this kind of performance!

*Actual Free Acid Normality =<0.04N



The Controller...

Home

Quality

Environment
Safety

Speed

Controller

Operation

Customer
List

Contact
Info

THE ELECTRONIC SECTION



- Electronic meters used are easily visible from across the room with no moving parts to wear out.
- Sophisticated Input Chemical Failure Alarm System provides automatic shutdown on input chemical failure.
- Check calibration circuit prevents runaway chemical adds.
- GFI circuit breaker protection for maximum safety.
- IC Time sequence circuit controls 12V, not 110V for maximum reliability.
- Valve solenoids are driven by independently fused, solid-state, zero-crossing relays.
- Bright panel lamps can easily be seen in well lit areas without generating excess heat.
- Plug-in modules allow easy replacement and upgrade.
- Fuse protection: 3A system, 3A 12V section, 2A 6V section, 2A 117V section, 1A for each valve.

THE CHEMICAL SECTION



The Controller...

Home

Quality

Environment
Safety

Speed

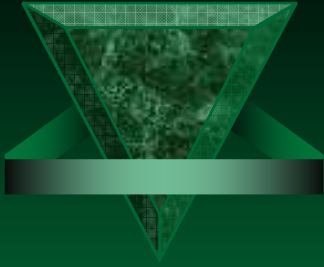
Controller

Operation

Customer
List

Contact
Info

- Glass Light Cells are immune to degradation from etchant.
- Glass Light Cells are made with Pyrex® glass to eliminate damage caused by thermal shock.
- New design CPVC valves custom made exclusively for Oxford V.U.E., Inc. outperform other designs used with etching chemicals.
- Spent valve has timer circuit in electronic section to hold valve open for a minimum of three seconds at a time to prevent hydraulic “hammering” when valve is turned off. This extends valve life significantly.
- All serviceable parts in the chemical section are assembled with unions. This allows five minute replacement using no tools.
- Etcher can be turned on immediately after servicing eliminating costly down time.
- Float assemblies used for acid and oxidizer provide low level indication and are modular in design. Floats can be replaced independently of housing at minimal cost.



Installation...

Home

Quality

Environment
Safety

Speed

Controller

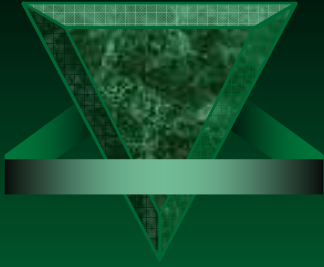
Operation

Customer
List

Contact
Info

System Requirements

- ✓ **Vis-U-Etch™ can be integrated into any DES line without any problem. However, to achieve the best results, the following requirements should be observed:**
- ✓ **Circulation pump should be able to move the entire sump capacity of the whole etcher through the pump within 5 minutes.**
- ✓ **Nozzles in the etch chambers should ideally be capable of a flow rate of 3.5 liters per minute with a pressure of 2.5 bar.**



Installation...

Installation of the Vis-U-Etch™ is simple!

- ✓ There are only 2 plumbing connections between the Vis-U-Etch™ and the etcher, a plumbing connection between the Vis-U-Etch™ and the Hydrochloric Acid and Oxidizer Tanks and a connection for the Spent Tank (when used)
- ✓ An Oxford V.U.E. person will be at site to advise the end-user on the installation.
- ✓ It normally takes less than a day to install the Vis-U-Etch™. And most times, production is not even affected!

Home

Quality

Environment
Safety

Speed

Controller

Operation

Customer
List

Contact
Info