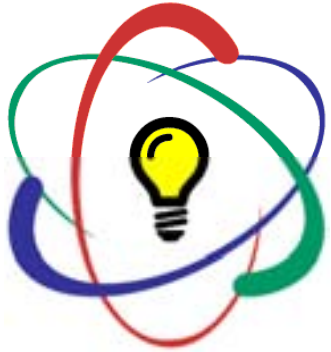




Automated Chemical Solutions, Inc.

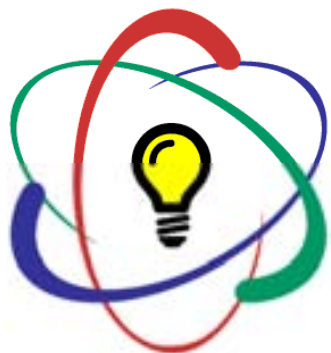
Corporate Overview



Challenges of Today's PWB Fabricator



- 💡 **Compete in the Global Marketplace**
- 💡 **Reduce cycle times and increase throughput**
- 💡 **Control processes to improve yields**
- 💡 **Reduce operating costs and improve profitability**

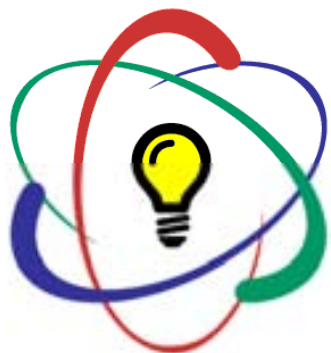


Automated Chemical Solutions...



...Answers these Challenges

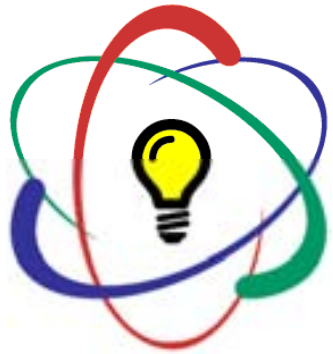
- 💡 **Cost effective, high performance chemical processes**
- 💡 **High activity, high loading chemicals**
- 💡 **Control systems tailored for specific processes**
- 💡 **Prompt, reliable delivery of consistent, high quality products**



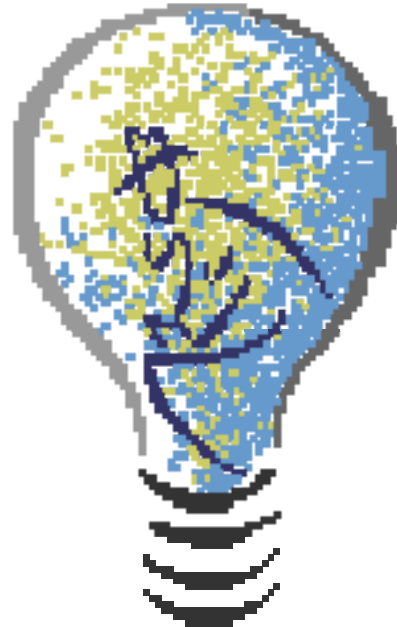
Automated Chemical Solutions



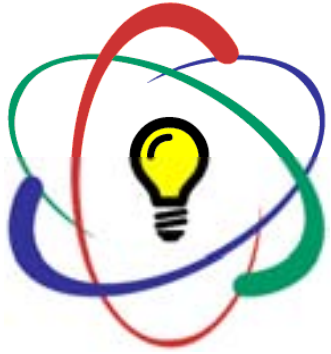
Founded:	April 1999
Headquarters:	Phoenix, Arizona
Fiscal Year 2009 Revenues:	\$3.0 million
Projected FY2010 Sales:	\$3.5 million
Products:	Chemicals and Controllers for
	Chemical Clean Innerlayer Bonding
	Developing Tin/Solder Stripping
	Etching Solder Leveling
	Resist Stripping Antifoams and Cleaners
	Foil Thinning Waste Treatment



Corporate Philosophy



- 💡 **Provide better products at better prices**
- 💡 **Excel at service**
- 💡 **Solve customer problems**
- 💡 **Make it easy to do business**



ACS Advantages

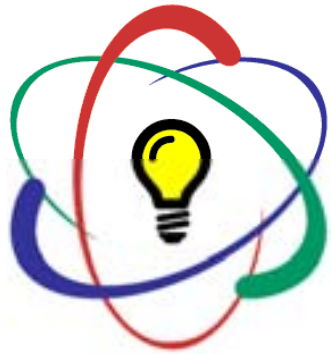


- 💡 **Innovative and Competitive Products**
- 💡 **Process Control Approach**
- 💡 **Easy Access to the Decision Maker**
- 💡 **Chemical Manufacturer not just a Chemical Blender**
- 💡 **Custom Formulating for Specific Requirements**
- 💡 **In-house Controller Design, Fabrication and Support**



Chemical Processes

**A Process Control
Approach**



Chemical Clean



SUREclean AC-1510

- 💡 Concentrated alkaline cleaner
- 💡 Quickly removes light soils and fingerprints
- 💡 Surfactant-free, clean rinsing formula



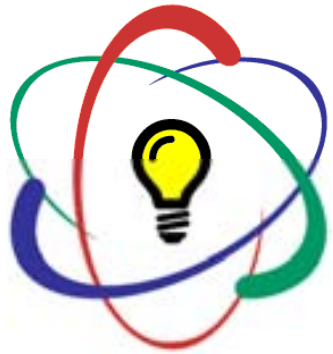
μETCH EM-2120

- 💡 Superior surface topography
- 💡 Increases etch rate
- 💡 Stabilized for reduced operating costs
- 💡 Consistent surface over entire Cu range

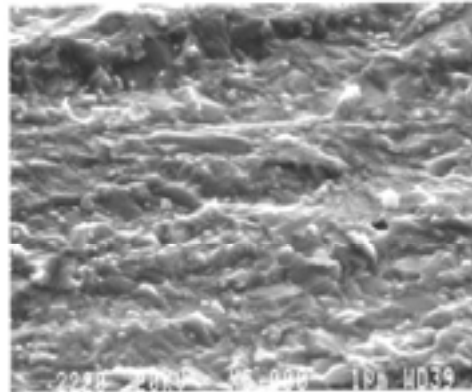


OXYshield AT-2320

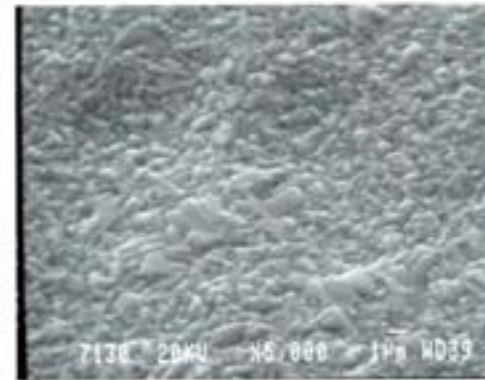
- 💡 Removes light oxides from copper surface
- 💡 Promotes dry film adhesion
- 💡 Prevents oxidation prior to subsequent processes



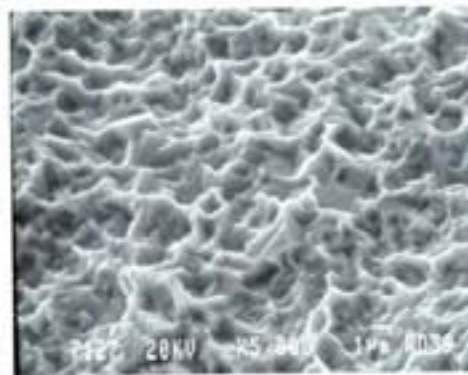
μ ETCH EM-2120



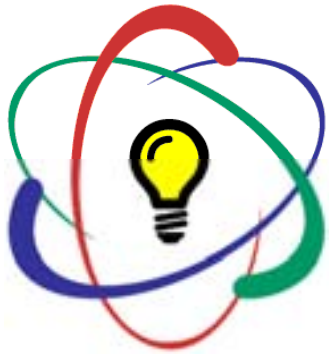
Sodium persulfate



Leading Brand



μ ETCH EM-2120



Foil Thinning



SUREclean PC-1520

- 💡 Concentrated acid cleaner
- 💡 Quickly removes conversion coatings, light soils and fingerprints
- 💡 Surfactant-free, clean rinsing formula



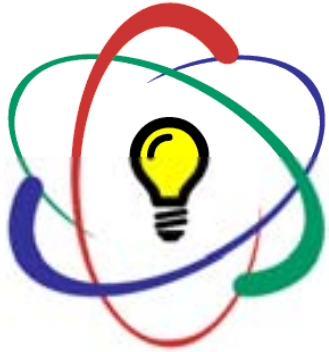
1/2ETCH CR-2185

- 💡 Dramatically less expensive than thin foil copper clad
- 💡 Consistent and precise final foil thickness
- 💡 Fast etch rates for high throughput



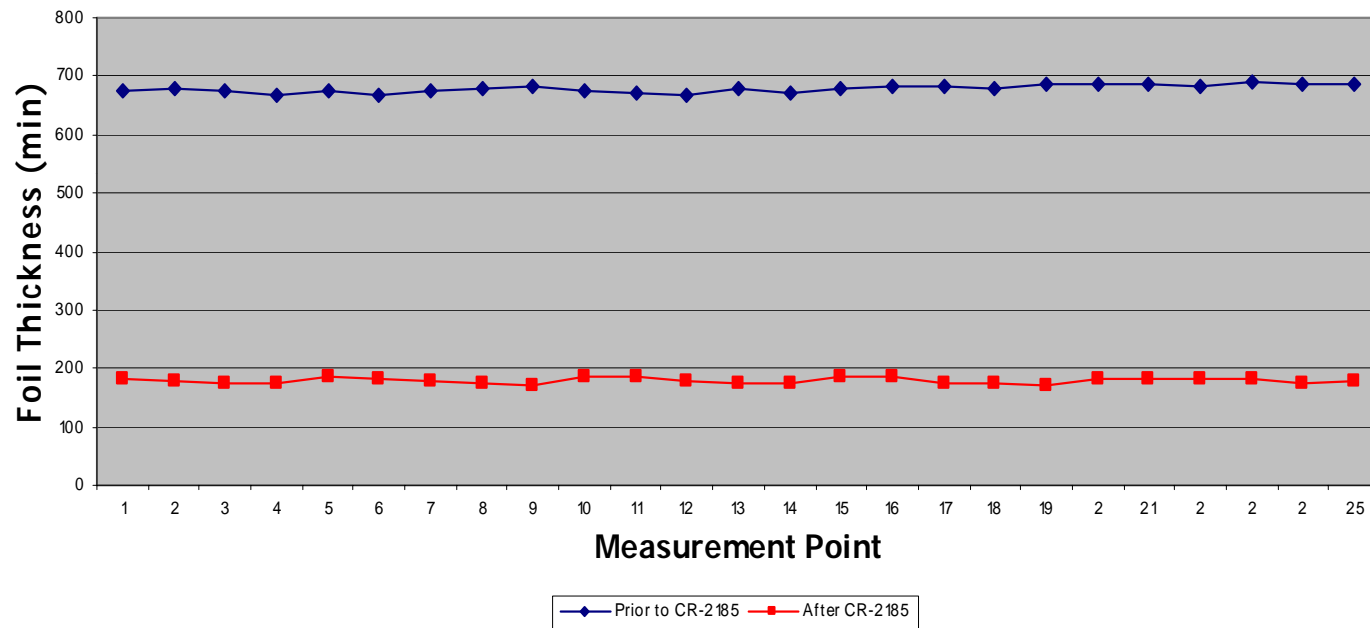
OXYshield AT-2310

- 💡 Removes light oxides from copper surface
- 💡 Promotes dry film adhesion
- 💡 Prevents oxidation prior to subsequent processes



½ ETCH CR-2185

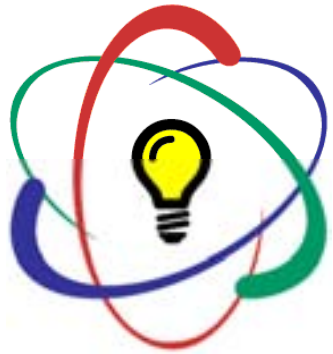
Foil Thickness Distribution



Overall thickness variation

Prior to CR-2185: 25 µm

After CR-2185: **16 µm**



Develop - Etch - Strip



DC-3030

MEL 450C

- 💡 450 g/L potassium carbonate
- 💡 Water softening additives
- 💡 Detergents additives



CC-4000

ETCHpro CC-4405

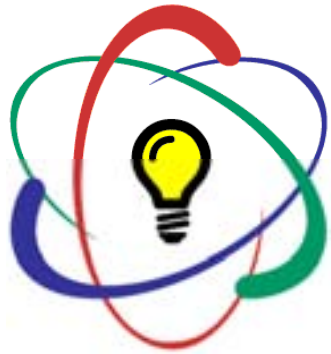
- 💡 High oxidizer normality
- 💡 Increased etch rates
- 💡 Safest, most stable oxidizer



RC-5030

AUTOstrip RS-5110

- 💡 Very low operating costs
- 💡 Leaves copper clean and uniform for AOI inspection
- 💡 Fast strip rates



Innerlayer Bonding



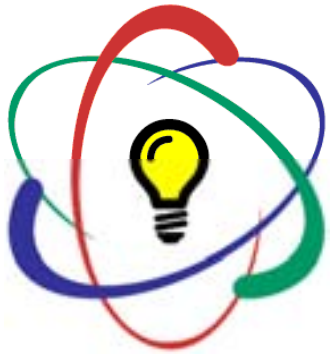
SUREclean AC-1510

- 💡 Concentrated alkaline cleaner
- 💡 Quickly removes light soils and fingerprints
- 💡 Surfactant-free, clean rinsing formula



QUICKLAM EM-6520

- 💡 Superior surface topography
- 💡 Wide operating window
- 💡 Very low operating costs



QUICKLAM PROCESS OUTLINE

SUREclean AC-1510

Alkaline Cleaner



Triple Cascade Rinse



QUICKLAM Pre-Dip



QUICKLAM EM-6520

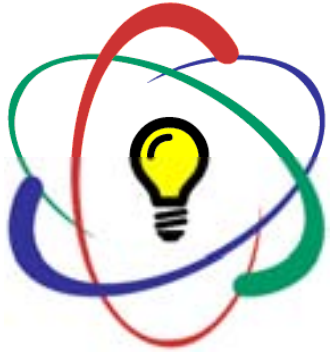
Innerlayer Adhesion Promoter



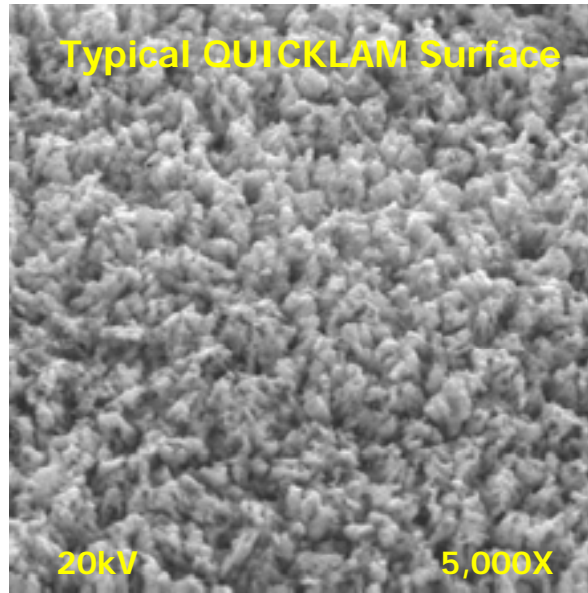
Triple Cascade Rinse



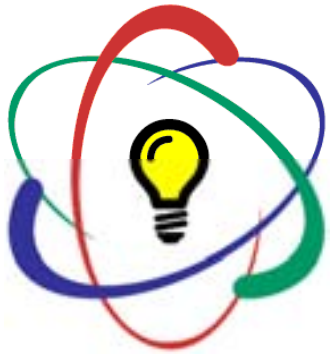
Forced Air Dryer



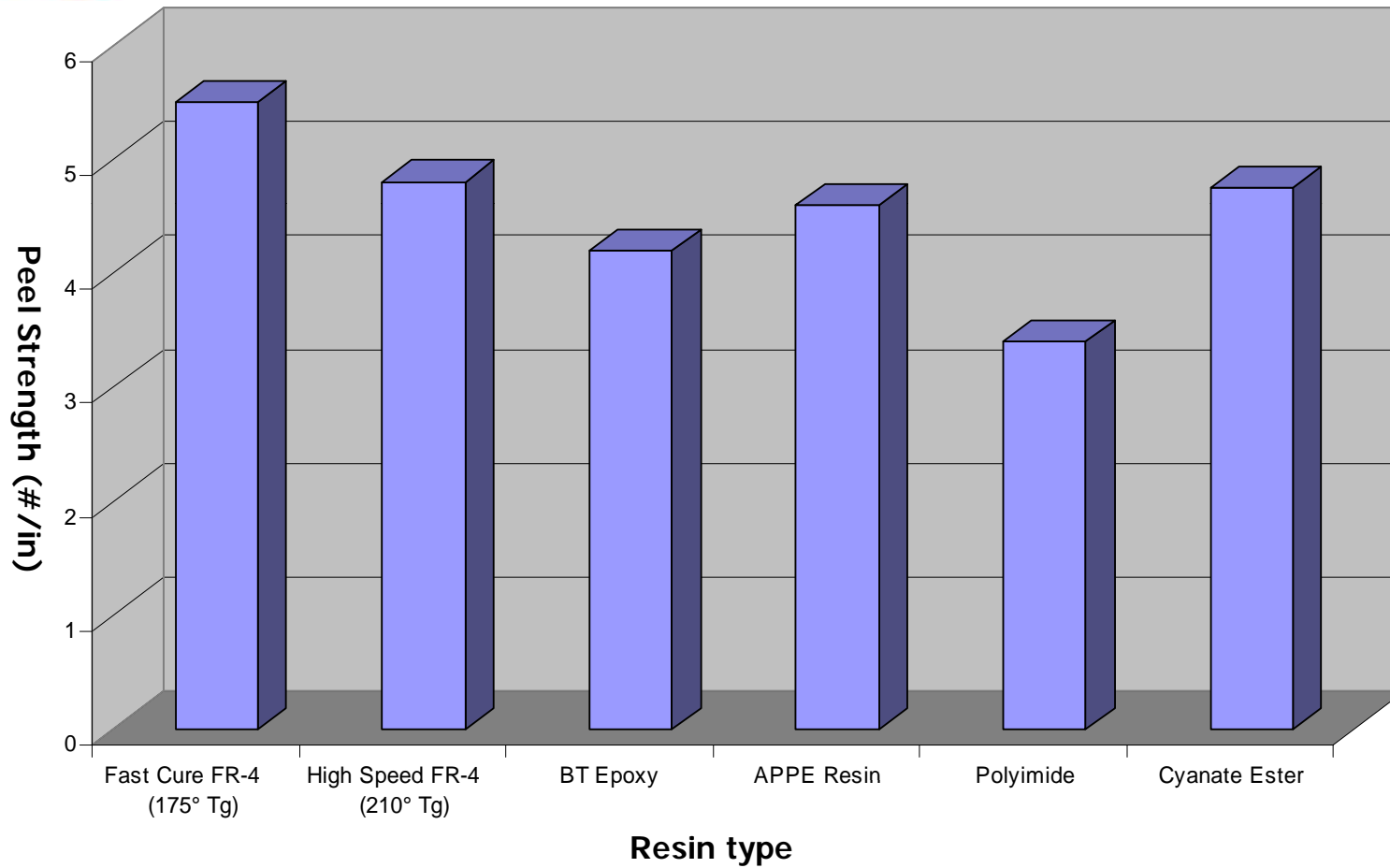
The **QUICKLAM** Difference

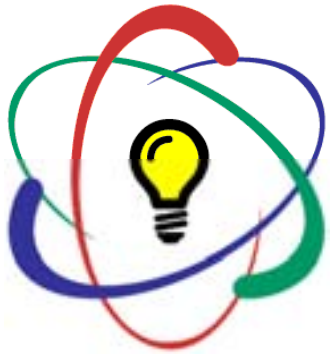


- 💡 **Effective at low concentrations - 4% vs. 20%**
- 💡 **Excellent bond strengths with all resins systems**
- 💡 **Applicable in immersion or spray processes**
- 💡 **Develops desired surface with less copper removal**
- 💡 **Improved tolerance to chloride contamination**
- 💡 **Extremely low operating cost**

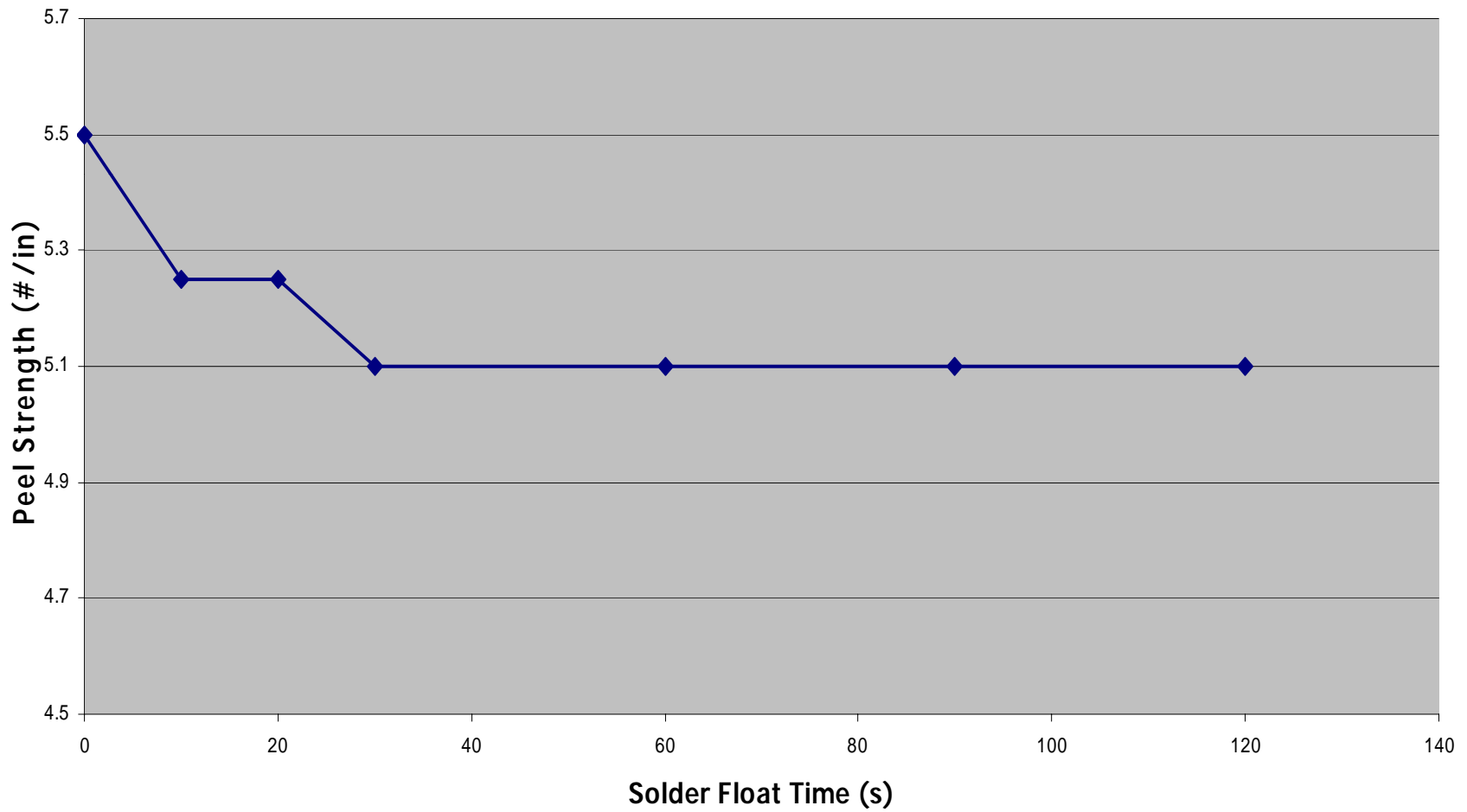


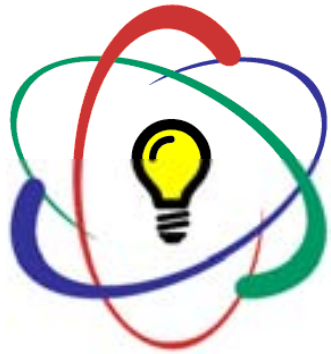
Typical Peel Strength Values



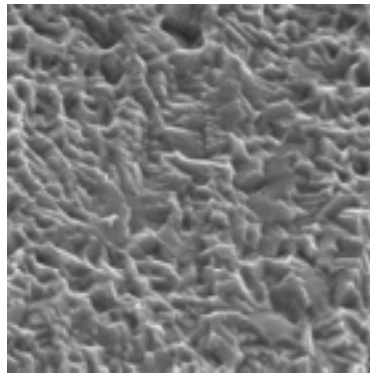


Peel Strength vs. Solder Float





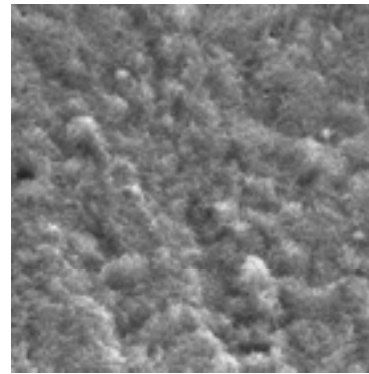
Conventional Black Oxide



Pre-Clean

SUREclean AC-1505

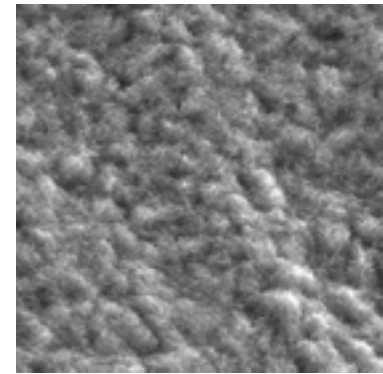
- 💡 Concentrated alkaline cleaner
- 💡 Quickly removes light soils and fingerprints
- 💡 Surfactant-free, clean rinsing formula



Microetch

μETCH EM-2120

- 💡 Superior surface topography
- 💡 Increases etch rate
- 💡 Stabilized for reduced operating costs



Oxide

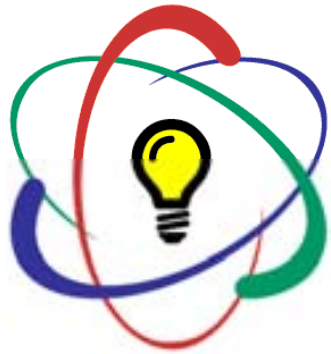
OXYbond OC-6200

- 💡 Superior bond strengths
- 💡 Durable, scratch resistant coating
- 💡 Rapid forming, uniform coverage

Reduction

REdox OR-6300

- 💡 Superior acid resistance
- 💡 Stabilized for reduced consumption
- 💡 Very low operating cost



Strip - Etch - Strip



AUTOstrip RS-5530

- 💡 Fast strip rates with optimal particle size
- 💡 Formulated for specific resists
- 💡 Completely removes adhesion promoters that cause excess copper



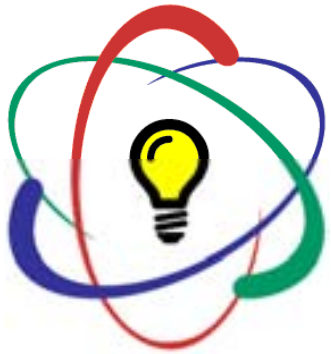
Micronutrients

- 💡 Recycled through strategic alliance
- 💡 Supported by MEL

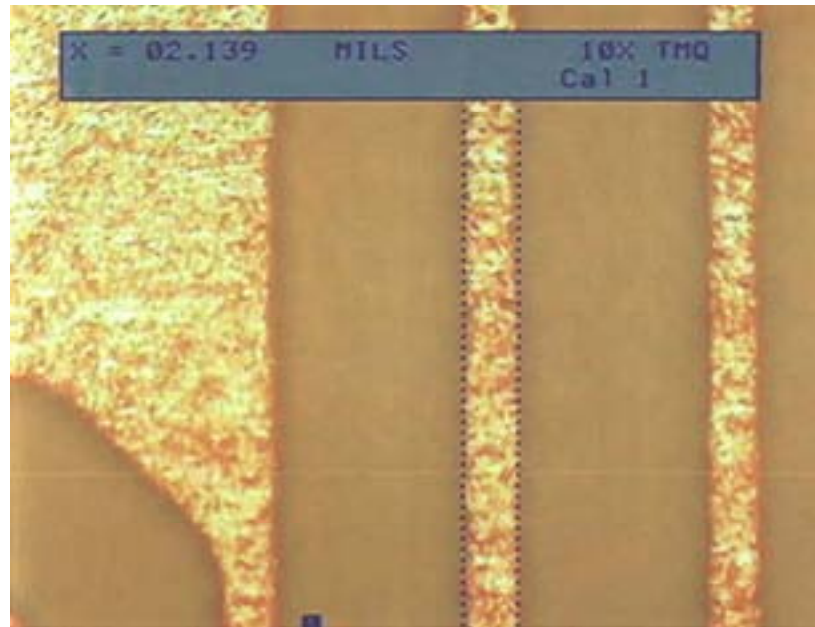


NITROstrip NS-7120

- 💡 High metal loading (S.G. > 1.4)
- 💡 Sludge-free
- 💡 Lowest operating cost



Fine Line Strippers

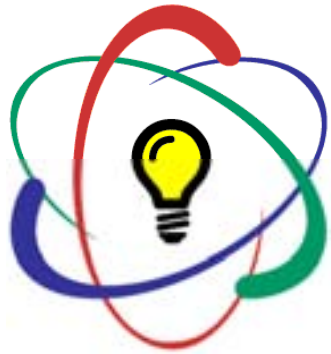


AUTOstrip RS-5530

For dry films with adhesion promoters

AUTOstrip RS-5532

For dry films without adhesion promoters



Hot Air Solder Leveling

Microetch

μETCH EM-2120

- 💡 Superior surface topography
- 💡 Increases etch rate
- 💡 Stabilized for reduced operating costs

Solder Flux

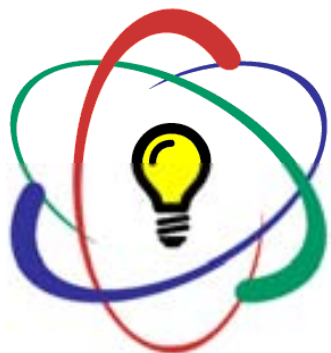
FLUXpro Series

- 💡 Horizontal and Vertical formulations
- 💡 High SIR's / Low surface ionics
- 💡 Excellent solder coverage

Post Clean

SUREclean FC-1800

- 💡 Neutralizes acid activators
- 💡 Completely removes organic residues



Miscellaneous Chemicals

FOAMaway AF-1120 - Antifoam

- 💡 Low cost
- 💡 High activity
- 💡 Soluble at operating concentrations

SUREclean EC-1300 - Equipment Cleaner

- 💡 Low cost
- 💡 Excellent for developers, etchers and strippers
- 💡 Reusable

SUREclean EC-1320 - Equipment Cleaner

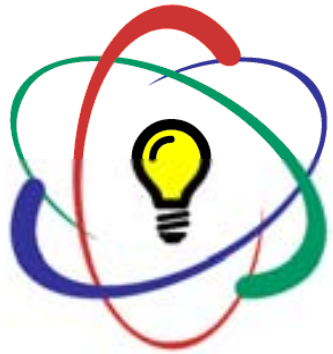
- 💡 Excellent for soldermask developers

SUREclean SC-1920 - Screen Cleaner

- 💡 Biodegradable & environmentally friendly
- 💡 High solvency with pleasant orange aroma

SUREclean MS-1950 - Soldermask Stripper

- 💡 Fast acting with little to no scrubbing required
- 💡 Resists measing and buttercoat attack
- 💡 No nasty amine odors



Future Projects



- 💡 **www.pcbchemicals.com**
- 💡 **Satellite manufacturing locations**
- 💡 **Metallization processes**
- 💡 **Alternative final finishes**