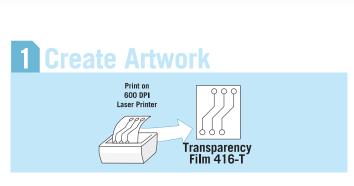
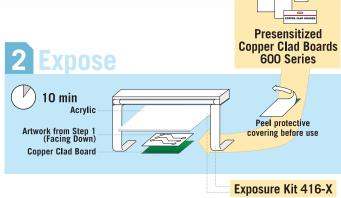
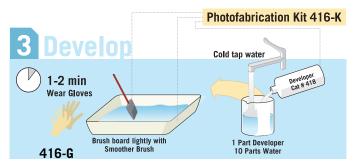
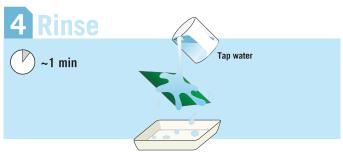
Use the M.G. Chemicals system to make your own circuit boards quickly and easily. Perfect for prototyping, hobbyists, and educational applications.

Technicians will be impressed with the high resolution, while amateurs will be impressed with the simplicity of our system.

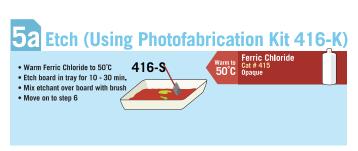




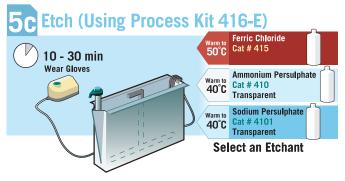


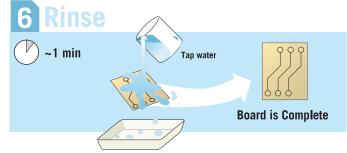


## Select Step 5 based on which kit you are using:

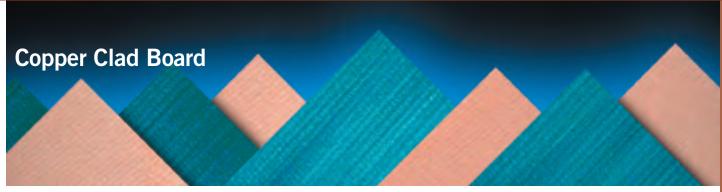








# Prototyping: Copper Clad Boards



### **Standard 500 SERIES**



A 1/16", 1/32", 1/64" laminate with 1 once copper. This flame retardant laminate is made of continuous woven glass cloth impregnated with epoxy resin. Developed specifically for the circuit processing industries' requirements. Provides ultraviolet blocking and fluorescence when using automated optical inspection (AOI).

Format	Cat. No.	Approximate Size
Single sided 1/16" (1.60mm)	503	3"x 5" (76mm x 127mm)
	506	4"x 6" (101mm x 152mm)
	509	6"x 6" 152mm x 152mm)
	512	6"x 9" (152mm x 228mm)
	515	8"x 10" (203mm x 254mm)
	521	12" x 12" (304mm x 304mm)
	575	24" x 36" (609mm x 914mm)
	580	36" x 48" (914mm x 1219mm)
Double sided 1/16" (1.60mm)	550	6"x 6" 152mm x 152mm)
	555	12" x 12" (304mm x 304mm)
	576	24" x 36" (609mm x 914mm)
	585	36" x 48" (914mm x 1219mm)
Single sided 1/32" (0.80mm)	586	4"x 6" (101mm x 152mm)
	588	6"x 9" (152mm x 228mm)
	590	12" x 12" (304mm x 304mm)
Double sided 1/32" (0.80mm)	587	4"x 6" (101mm x 152mm)
	589	6"x 9" (152mm x 228mm)
	591	12" x 12" (304mm x 304mm)
	596	36" x 48" (914mm x 1219mm)
Double sided 1/64" (0.40mm)	598	6"x 9" (152mm x 228mm)

# **Positive Presensitized**

600 SERIES



Available in 1/16" (62 mil) and 1/32" (30 mil) laminate with 1 ounce copper. Provides high resolution and excellent fine line control. Ideal for prototypes, small production runs, student training.

Format	Cat. No.	Approximate Size
Single sided 1/16" (1.60mm)	603	3"x 5" (75mm x 125mm)
	606	4"x 6" (100mm x 150mm)
	609	6"x 6" (150mm x 150mm)
	612	6"x 9" (150mm x 230mm)
	630	8"x 12" (200mm x 300mm)
Double sided 1/16" (1.60mm)	650	6"x 6" (150mm x 150mm)
	660	6" x 9" (150mm x 230mm)
Single sided 1/32" (0.80mm)	687	4"x 6" (100mm x 150mm)
	689	6" x 9" (150mm x 230mm)
Double sided 1/32" (0.80mm)	690	6"x 9" (150mm x 230mm)
Double sided 1/64" (0.40mm)	698	6"x 9" (152mm x 228mm)

# Paper Phenolic Positive Presensitized CCB

### 1/32" laminate with one ounce copper

Easily cut this material into custom sizes. Score on both sides with a utility knife and snap in half.

Format	Cat. No.	Size
Single sided 1/32" (0.80mm)	675	12"x 18" (300mm x 450mm)
Double sided 1/32" (0.80mm)	676	8"x 12" (200mm x 300mm)

Convenient kit includes major components required to expose presensitized copperclad boards.

#### Includes:

- Fluorescent light fixture with stand (brackets)
- Daylight fluorescent tube
- Clear acrylic weight for artwork
- Complete instructions



### **Available Sizes**

416X	Catalog No.	Size	Format
416X	416-X	Fits 17" tube	Kit

### Photofabrication Kit 416-K

Produce printed circuit boards using the positive photofabrication process.

#### **Contains:**

- One 3"x5" presensitized single sided PCB Cat# 603
- One 4"x6" presensitized single sided PCB Cat# 606
- One 6"x6" presensitized single sided PCB Cat# 609
- One 500ml bottle Developer Cat# 418
- One 500ml bottle Ferric Chloride Cat# 415
- Two Foam Brushes Cat# 416-S
- Plastic development tray
- Rubber gloves
- Instruction sheet

### Additional items Required

- Exposure Kit Cat# 416-K
- Etchant tank, or glass tray, or plastic tray (for etching purposes)
- Artwork laser printed on a transparency, Cat# 416-T
- Eye protection



#### **Available Sizes**

416K	Catalog No.	Size	Format
416K	416-K	Tank size L x W x H: 11"x 7"x 5"	Kit

### Etch Resist Pen 416-RP



For drawing or touching up etch resist circuits on PC boards and on positive films. Draws lines 1/32" wide. Dries instantly.

### Available Sizes

 Catalog No.
 Size
 Format

 416-RP
 5.5" long
 Pen

# Transparency Film 416-T



Letter size (8 1/2" x 11") heat stabilized film sheets for use in most laser printers. For use in producing the artwork required for the photofabrication process.

#### **Available Sizes**

416T Catalog No. Size Format 8.5" x 11" Envelope of 5 sheets

# Prototyping: Accessories

# **Developer 418** For use with MG Chemicals' 600 series positive presensitized boards. Concentrated developer to ten parts of tap water. The image appears quickly as the exposed photo resist is dissolved. After develritte (b. 41e/on oping is complete, rinse with water and the board is ready for etching. Use 416-S foam brush for best results. Also available in the 416-K Photofabrication Kit

# **Liquid Tin**

Quickly tinplates copper circuits on PC boards in 5 minutes or less at room temperature.

- Provides excellent solderability
- Protects against oxidation
- No mixing or dilution required
- For commercial / industrial use only



#### **Directions**

Clean PC Board thoroughly. Pour Liquid Tin into an appropriate size tray constructed of polypropylene, polyethelene, or similar material. Do not use stainless steel. Immerse PC Board in the solution for 3 to 5 minutes. Rinse with warm water and dry.

#### Available Sizes

401	Catalog No.	Size	Format
421	421-500ML	500ml (17 oz)	Liquid

### **Conductive Print**

Catalog No.

418-500ML

**Available Sizes** 

- Quick drying
- Durable acrylic base pigmented with high purity flakes
- Excellent for repairing and modifying printed circuits and EMI / RFI shielding applications



#### Silver Print 842

Size

500ml (17 oz)

Format

Liquid

Resistivity: 0.2 0hm · mil Also available in a micro-tip dispensing pen format.

Silver pigment provides excellent corrosion resistance

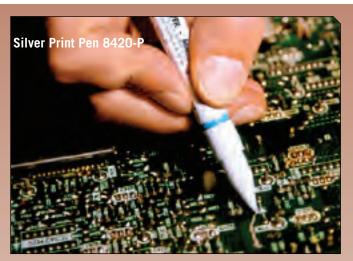
**Silver Coated** 843 **Copper Print** 

Resistivity: 0.4 Ohm · mil



#### **Nickel Print** 840

Resistivity: 0.7 Ohm · mil



#### Available Sizes

842	Catalog No. 842-20G 842-250G 8420-P	<b>Size</b> 20g (0.75 oz) 250g (8.8 oz) 8.5g (0.3 oz)	<b>Format</b> Liquid Liquid - Bulk Microtip Pen
843	843-250G	250g (8.8 oz)	Liquid
	843-900ML	900ml (30 oz)	Liquid - Bulk
840	840-20G	20g (0.75 oz)	Liquid
	840-250G	250g (8.8 oz)	Liquid - Bulk

# **Premium Etching Kit 416-E**

- Etch copper clad circuits professionally
- Accommodates two 8" x 12" double-sided copper clad boards



#### Contains:

- 7 litre capacity heavy-duty polyethylene etching tank
- Sturdy mounting bracket
- Clear acrylic lid
- Heavy duty air pump
- Sparging unit with 3 way adjustable air manifold
- Requires a minimum of 7 liters of etching solution: 415-4L, 410-1KG, or 4101-1KG.

### Available Sizes

416E Cata	Catalog No.	Format
416E	416-E	Kit

### **Replacement Parts**

**Catalog Number** Quantity Description 416-AP Air pump Replacement Air Pump for the 416-E Professional Etching Kit Replacement Air Tubing for the 416-E Professional Etching Kit The 416B is a direct replacement bulb for the 416-X Exposure Kit. 416-D Hose Replacement part for the 416-E Professional Etching Kit 10 pack Gloves Vinvl Gloves - Excellent for use with all corrosive chemicals. 416-H Heater 200 watt side mounting immersion heater with quartz element and adjustable temperature control. Replacement part for the 416-E

# **Etching Process Kit - Student**

- Etch copper clad circuits professionally
- Accommodates two 8"x 9" double sided copper clad boards



Ideal for students and hobbyists. An inexpensive etching system with professional quality output.

#### Contains:

- 5 liter heavy duty polyethylene etching tank
- Air pump and tubing
- Sparging unit
- Bag of vinyl gloves
- Complete instructions

Also requires a minimum of 4 liters of Ferric Chloride (Cat# 415-4L). There must be enough Ferric Chloride to completely cover your board.

Do not dilute ferric chloride with water.



Catalog No.

**Format** 

Professional Etching Kit.

# **Prototyping: Etchants**

### Ferric Chloride 415

# Liquid

- Copper Etchant
- More aggressive than persulphate alternative
- Ready to use
- · Can be stored and reused

Ready to use solution designed for etching printed circuit boards and other metals. Recommended for use with M.G. Chemicals Professional Etching Process Kit (416-E) and M.G. Economy Etching Process Kit (416-ES).



### **Powder**

- Easy to mix.
- . No heating required. Solution self heats to ideal operating temperature during mixing process (60°C / 140F°)
- Mixed solution can be stored and reused.
- Just as effective as Liquid Ferric Chloride.
- · Easy to transport due to lightweight of powder.



A dry concentrate version that mixes with water to produce 1 liter of etchant solution, enough to etch 400 sq. inches of 1 oz boards.

### **Directions of Use**

Immerse copper board in solution and agitate until etching action is completed. Ferric Chloride can etch up to a maximum of 100g of copper per liter of solution (1.3 square meters or 14 square meters of 1 oz copper clad board). The etching process can be sped up by heating the solution to a temperature no higher than 55°C (135°F). Ferric Chloride is compatible with the 416-E and 416-ES kits. Do not dilute with water.

#### **Available Sizes**

415	Catalog No.	Size	Format
415	415-500ML	500ml (17 oz)	Liquid
	415-1L	1L (34 oz)	Liquid
	415-4L	4L (1 gal)	Liquid
	415-20L	18.9L (5 gal)	Liquid
	415-115G	155 g (4 oz)	Powder

# **Sodium Persulphate**

4101

- Transparent solution allows visual inspection
- Will not stain carpet or clothing
- Compatible with etch resist pens
- Alternative to ferric chloride
- 1 kg of solid crystals makes 4 liters of solution



### Available Sizes

31263		
Catalog No.	Size	Format
4101-1KG	1kg (2.2 lbs.)	Crystals
4101-25KG	25kg (55 lbs.)	Crystals
	4101-1KG	Catalog No.         Size           4101-1KG         1kg (2.2 lbs.)

# **Ammonium Persulphate**

- Transparent solution allows visual inspection
- Will not stain carpet or clothing
- Not compatible with etch resist pens
- Alternative to ferric chloride
- 1 kg of solid crystals makes 4 liters of solution



#### **Available Sizes**

440	Catalog No.	Size	Format
410	410-1KG	1kg (2.2 lbs.)	Crystals
	410-25KG	25kg (55 lbs.)	Crystals