

OPERATING INSTRUCTIONS #416-ES ETCHING KIT

For use in the etching process of professional looking printed circuit boards using M.G. Chemicals positive photofabrication products. Excellent for prototyping or small production run requirements.

WARNING: Avoid skin contact with the etchant or direct breathing of vapor. Always wear protective gloves, eyewear and clothing. Use in a well ventilated area.

Cleanup with warm soapy water. Used Ferric Chloride Solution etchant can be placed back into the original container. Please note Ammonium Persulphate needs to be transferred into a vented container of plastic or glass because it continues to gas off after use. Failure to use a vented container will cause gas buildup and will rupture the container. Always write "waste material" on the containers of used chemicals and dispose of them in an environmentally safe fashion in compliance with local waste regulations.

M.G. Chemicals cat #416-ES Etching Kit contains the following items:

- 1) 5.6 litre (1.5 gallon) plastic tank and lid
- 2) Light duty air pump,
- 3) Single line sparging unit including air hose
- 4) Single pair of latex disposable gloves

**This kit contains no
chemical products**

Instructions:

- A) Set up the tank on a stable surface, in a secure area where you will be working. Fill tank with etchant of choice (Ferric Chloride Solution or Ammonium Persulphate), to desired level. Do not fill above 3.5 cm (1.5 inches) from the top of the tank.
- B) Position the sparging unit in the tank with the air tubing exiting from the top of the tank. Place the air pump above the level of etching solution to prevent a back flow of etchant into the pump. Connect the airline from the sparger to the air output on the pump. The pump is turned on and off by plugging into your electrical outlet. No adjustments are required to control the air flow into the sparging unit.
- C) Place your board(s) that are READY FOR THE ETCHING PROCESS in between the rails of the sparging unit. For best results it is recommended that MG Chemicals 600 series presensitized copper clad boards be used.(Refer to M.G.Chemicals' photofabrication instructions located with every 600 series board). Submerge sparging unit until the boards are completely covered by the etchant. To produce a more consistent etch, turn the boards over after 5-10 minutes in the etching solution. Periodically check the boards to see when they are finished the etching process. This should take approximately 30 minutes. Leaving the boards in the etchant for too long may result in over etching and possible damage to board and traces.
- D) To remove used etchant from tank:
Always use protective equipment for yourself and surrounding areas when using or transferring etchant. Refer to Material Safety Data Sheets for recommended safety equipment and emergency response procedures in case of spills.
Place the container you are using for used etchant below the bottom level of the etchant tank and be sure your syphon hose can reach both. If you do not have an appropriate siphon hose, M.G. Chemicals cat# 416-D syphon hose is available where you purchased this kit.
To prevent the flow of liquid, close the shut-off clamp on the hose end. Submerge hose in water to completely fill it up. When filling the hose with water be sure all air is removed from the hose. Place the clamp end of the hose into the container your are transferring to and put the other end of the hose towards the bottom of the etchant tank. Release the shut-off clamp.
Water will begin to flow into the container and quickly turn to etchant. While syphoning always watch the container you are filling into, use shut off clamp to stop syphoning before container gets to full to prevent accidental spillage. Once the etchant level has dropped down and syphoning is completed, *carefully* pour the remaining etchant into your container using a funnel. Seal container and write "Waste Material" on it. Store and dispose of used etchant as outlined on the Material Safety Data Sheet for that product. Clean up with warm water.

Please call our Toll free number @ 1-800-201-8822 where a Customer Service Representative is available to answer your questions weekdays 8 AM to 5 PM PST. or refer to our website for a visual demonstration of this process @ www.mgchemicals.com