

Multi-Etch®

The Non-Acid Etching Alternative for Titanium and Other Metals

Safety

Multi-Etch® solution is crystal clear — it looks like water! All containers that are used to hold Multi-Etch® should be marked as poison. Dispense only into plastic containers. Do not store in glass containers! Provide positive ventilation, eye and skin protection! See FIRST AID INSTRUCTIONS on last page.

The following instructions are for titanium. For other metals, see the enclosed chart.

Etching Titanium for Anodizing

Note: **You MUST mix up the entire unit**--you cannot mix smaller amounts of Multi-Etch® and have it be effective. Once the unit is mixed, if unused, it has a shelf life of at least 8 months. Pour out only as much as you need for the task at hand, leaving the rest unadulterated. One unit of Multi-Etch® will effectively clean at least 1,500 square inches of titanium with an etching time of approximately 3 seconds at 120-160°F. Do not return used Multi-Etch® to original container; store separately in a sealed plastic container.

Hot or cold?

Heating the solution of Multi-Etch® is the most effective and quickest way to etch but using Multi-Etch® cold is a lot simpler as you don't need the heating equipment. Cold working uses double strength Multi-Etch®. If you want to try both, mix the entire unit of Multi-Etch® with 1/2 gallon (1.89L) of distilled water and let it sit overnight to make sure all crystals are dissolved. Mark the storage container "double strength" and "POISON" and use it as is for cold-working. For hot working, add an equal amount of distilled water to make regular strength and follow the hot working procedures. It is best to have your anodizing station ready to go before etching.

How is Surface texture affected?

Multi-Etch® will maintain whatever texture--from polished to matte-- you apply providing you do not etch too long. Longer etching times will remove the surface texture, but Multi-Etch® never "bites" as much as hydrofluoric acid.

COLD WORKING EQUIPMENT NEEDED

1. A plastic container with lid to mix up and hold solution. The container should be a minimum volume of one gallon (3.78L) in order to have room for mixing. **Metal containers should NOT be used** as the solution will etch the metal. The same is true, to a lesser extent, for glass.
2. Plastic stirrer
3. Plastic strainer, preferably with a handle for bulk etching.
4. Distilled water

COLD WORKING PROCEDURES

All etching times are approximate and can vary according to the grade (chemical composition) of the metal, age of the solution and the desired effect.

SET UP AND MIXING

Fill a rinse container with distilled water and place near the etching station. For optimum safety, wear eye protection and rubber gloves. Cut open the pouch of Multi-Etch® powder and dump the ENTIRE contents into a plastic holding tank.

NOTE: You must use the complete amount of powder in the packet; do not attempt to measure out smaller portions.

Slowly pour in 1/2 gallon (1.89L) of distilled water. Stir with a plastic stirrer. You can let this solution sit overnight (with lid in place) and stir again the next day. If you need to use it right away, cap the container and shake well.



MARK ALL CONTAINERS: POISON



PRE-CLEANING

Any grease or oil must first be washed off the metal. Simple Green® works well--spray on and rinse off. If the metal is very oxidized (for example, after tumbling), and you want it textured via bead-blasting, sanding, grinding, etc., it is best to do two etching sessions. First etch for 3-4 minutes, then texture the metal, and then etch a second time for 3-4 minutes, rinse, and then anodize.

ETCHING

Pour out only as much Multi-Etch® as you need for the task at hand.

After degreasing your metal either suspend in Multi-Etch® with a niobium wire OR stir with a plastic stirrer throughout the etching process so the metal does not sit still. You could also use something that vibrates the bath continuously during the etching process. Etch for 3 or 4 minutes.

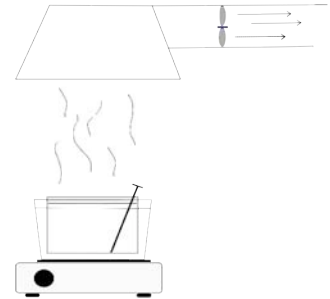
After etching, put the piece into the rinse container, then into your anodizing bath.

Apply a 5 volt color (a base coat) to the titanium which will stabilize/seal the surface and allow you to put the piece aside for more detailed coloring after the etching session. Rinse in distilled water, then dry. Six months later it will still color beautifully. Base-coating is necessary for titanium only. This works great for preparing quantities of titanium to be anodized with higher voltages later.

Practice on scrap first to make sure you get the colors you want. If the results are splotchy or have a white cast after anodizing, you can add distilled water to make the mixture regular strength, and use it heated.

HOT WORKING EQUIPMENT NEEDED

1. A simple fume hood with exhaust fan is required for etching indoors. You can etch outdoors but power for the heat source is needed. A diagram of a suitable set-up is pictured at right. Make sure there is enough clearance between the heated solution and the fume hood to dip and remove your metal.



2. A pickle pot OR all of the following:

- a. Basic hot plate
- b. Baffle screen for use on top of the hot plate
- c. Metal pan (filled partially with water)
- d. Plastic bowl to float in metal pan

3. Probe-type thermometer with a range up to 210°F (non-metallic)

4. A plastic container with lid to mix up and hold solution. The container should be a minimum volume of one gallon (3.78L) in order to have room for mixing. **Metal containers should NOT be used** as the solution will etch the metal. The same is true, to a lesser extent, for glass.

5. Plastic stirrer

6. Plastic strainer, preferably with a handle for bulk etching.

7. Distilled water

HOT WORKING PROCEDURES

All etching times are approximate. The times can vary according to the grade (chemical composition) of the metal, temperature of the solution, age of the solution (including how long it has been heated) and the desired effect.

SET UP AND MIXING

Fill a rinse container with distilled water and place near the etching station. For optimum safety, wear eye protection and rubber gloves. Cut open the pouch of Multi-Etch® powder and dump the ENTIRE contents into a plastic holding tank.

NOTE: You must use the complete amount of powder in the packet; do not attempt to measure out smaller portions.

Slowly pour in 1 gallon (3.78L) of distilled water. Stir with a plastic stirrer. You can let this solution sit overnight (with lid in place) and stir again the next day. If you need to use it right away, cap the container and shake well.



MARK ALL CONTAINERS: POISON



PRE-CLEANING

Any grease or oil must first be washed off the metal. Simple Green® works well--spray on, rinse off, and dry with paper towel. If the metal is very oxidized (for example, after tumbling), and you want it textured via bead-blasting, sanding, grinding, etc., it is best to do two etching sessions. First etch for 10 seconds to remove the oxide, then texture the metal, and then etch a second time FOR 3 SECONDS and then anodize.

HEATING

Turn on the exhaust fan. Shake or stir contents of the holding tank. When the undissolved powder is suspended, pour the necessary amount into the pickle pot or plastic container in which you will heat the solution. Heat only as much solution as you think you'll need for one session; more solution can be added as needed upon evaporation. Heat to 120-160°F and maintain that temperature until you have finished etching. Higher temperature will shorten the effective life of the solution. A pickle pot automatically maintains the correct temperature.

Another method to indicate when the proper temperature is reached is to look for the fine bubbles that come to the surface of the Multi-Etch®--when you see the bubbles, it's ready. After 10 minutes or so, the bubbles disappear but the etchant is still effective.

ETCHING AND BASE-COATING

Submerge your metal into the heated solution and count to 3 (slowly: 1 and 2 and 3) while moving the metal. After etching, put the piece into the rinse container, then into your anodizing bath.

Apply a 5 volt color (a base coat) to the titanium which will stabilize/seal the surface and allow you to put the piece aside for more detailed coloring after the etching session. Rinse in distilled water, then dry. Six months later it will still color beautifully. Base-coating is necessary for titanium only. This works great for preparing quantities of titanium to be anodized with higher voltages later.

Practice on scrap first to make sure you get the colors you want.

DISPOSAL

Dispose of contents/container in accordance with local/regional/national/international regulations.

FIRST AID INSTRUCTIONS

SWALLOWING: Call a poison center or physician if feeling unwell. Rinse mouth.

*Do **NOT** induct vomiting.*

SKIN CONTACT: Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse.

INHALATION: Remove to fresh air and keep at rest in a position comfortable for breathing. Call a poison center or physician if feeling unwell.

EYE CONTACT: Rinse cautiously with water for several minutes. If wearing contact lenses, remove if possible. Continue rinsing. If irritation persists, seek medical attention.

Further safety information is contained in the enclosed safety data sheets (SDS) for dry and liquid forms of Multi-Etch®.

24-HOUR EMERGENCY HOTLINE: (800)535-5053