TITANIUM & NIOBIUM ANODIZING KIT

Please note, this is a guide for a kit from the USA. Caswell Australia does not sell this kit, but it does sell the important individual components. If you have any questions, please don't hesitate to contact Caswell Australia.

A multitude of colors and colored effects can be achieved on titanium, niobium and other reactive metals by anodizing them. Our Titanium and Niobium Anodizing kit allows anyone to do this at home.

NOTE: Seller cannot control use of this product and will not accept liability for more than product replacement. **WE HIGHLY RECOMMEND PRACTICING ON SCRAP METAL FIRST.**

The US kit contains:

- 0-120V, 1 amp DC Rectifier
- 2 Gallon HDPE Tank and Lid
- 1lb Titanium Anodizing Powder (Makes 1 gallon)
- 1 Pint Liquid Degreaser
- 4" x 8" Stainless Steel Cathode
- Anti Spark Mesh For Cathode
- Masking Tape
- Titanium Hanging Wire
- Pen Wands for Spot Anodizing
- Gloves

Additional Items Possibly Required

In addition to the contents of the kit, you may need to acquire:

- Approx 2 gallons of Distilled or Deionized water (mixing and rinsing)
- Electrical Tape
- GFCI Outlet or Plug in GFCI Extension
- Small Sharp Knife (for cutting masks)
- Plastic dowel or rod to hang the part(s) being anodized.

Preparing The Kit

To prepare your kit for use, first mix the 1lb of Titanium Anodizing Powder with 1 gallon of distilled water. The solution is non-toxic and drain safe when disposal is required.

Place Stainless Steel Cathode into the protective mesh and secure onto the side of the plastic tank with clips, tape etc. You may also choose to cut a 1/16 strip, 9/10 of the way up the side of the cathode, bend that backward and use the strip to hang the cathode over the wall of the tank.

Remove the rectifier from the box and plug into a GFCI outlet. Do NOT turn on. Always plug into a properly grounded outlet. NEVER modify the plug by cutting off the ground. Always check the plug and cord for signs of wear or damage and do not use if damaged in any way.

WARNING: The rectifier outputs HIGH VOLTAGE. Improper use will result in an electrical shock that may be fatal. Always use extreme caution when handing high voltages. A GFCI provides some measure of protection, but it is not foolproof.

Place a piece of wood or plastic across the top of the tank.
Attach the part(s) to be anodized to a length of titanium wire.
Attach the black lead to the negative terminal on the rectifier and then to the stainless steel cathode.
Attach the red lead to the positive terminal on the rectifier. Do not attach to the part yet.
Put on protective gloves.

Using The Kit (Basic Instructions)

Clean the parts to be anodized in the liquid degreaser concentrate. Rinse with distilled water and check them by performing a Water Break Test. Water should sheet off the part and not bead up. If water beads, clean again. Dirty parts will not anodize correctly.

Hang the part(s) from the plastic dowel into the anodizing solution and attach the wire to the plastic dowel. **NO OTHER METAL OBJECTS SHOULD BE INSERTED INTO THE ANODIZING SOLUTION, OTHER THAN THE PART, TITANIUM WIRE AND STAINLESS CATHODE.**

Attach the red lead to the titanium wire. You're now ready to anodize.

IMPORTANT: ENSURE THAT THE VOLTAGE KNOB ON THE RECTIFIER IS TURNED DOWN (COUNTER CLOCKWISE) ALL THE WAY BEFORE TURNING ON THE UNIT.

WARNING: DO NOT ALLOW THE PART TO COME IN CONTACT WITH THE STAINLESS STEEL CATHODE. IT WILL SPARK AND CAUSE A SHORT. THE SUPPLIED SPARK SHIELD HELPS PREVENT THIS.

Turn on the rectifier.

WARNING: The rectifier outputs HIGH VOLTAGE. Improper use will result in an electrical shock that may be fatal. Always use extreme caution when handing high voltages. A GFCI provides some measure of protection, but it is not foolproof.

Turn the voltage knob up to approx. 20 volts. In just a few seconds, you should see the part start to change color. Different voltages achieve different colors. Experiment with different voltages and anodizing times to get different effects. Note: Once an area of the part has been anodized at a high voltage, it will not anodize at a lower voltage, so for varying colors, start low and end high.

Finally, turn off the rectifier and turn the voltage knob all the way down. Unplug the power cord from the unit, then detach the red and black leads. It's not safe to touch your part and remove it from the liquid.

Spot Anodizing

Using the supplied pen wands, you can anodize patterns, select areas, or actually write on the surface of the metal.

To start, attach the open end of one of the pen wands to the lead with two banana plugs. Plug into the BLACK (negative) terminal. Wrap the connection area with a heavy layer of electrical tape to insulate the connection and avoid a shock.

Put on gloves. Clip the positive lead to the part being anodized (after cleaning properly).

Dip the felt end of the wand into the anodizing solution. You may decant a small amount into a cup for ease of use.

WARNING: The rectifier outputs HIGH VOLTAGE. Improper use will result in an electrical shock that may be fatal. Always use extreme caution when handing high voltages. A GFCI provides some measure of protection, but it is not foolproof.

Ensure rectifier is set to zero volts. Turn on the rectifier and select the appropriate voltage to achieve the desired color. Move the wand over the metal and watch the anodizing take place in front of your eyes.

Advanced Techniques

Creating Rainbow Effects

To create a rainbow effect on a part, simply immerse the part fully in the solution and turn on the rectifier. Set to the required voltage. As anodizing starts to take place, slowly lift the part from the bath. The area of the part out of the solution will remain the color it is, while the portion in the bath will continue to anodize to a different color. Some experimentation will yield amazing results.

Using Masks to Create Multiple Colors

By using the supplied masking tape, it is possible to prevent certain areas on the part from anodizing.

Ensure the part is clean, and then apply the tape to any areas on the part that you don't want to anodize. Use a sharp craft knife to cut out any desired shapes or patterns. Ensure there are no air bubbles.

Note: Once an area has been anodized at a higher voltage, it will not re-anodize to a different color at a lower voltage. Start with your high voltage colors and end low.

Anodize the part at the desired voltage. Remove the mask and re-anodize. Continue until your desired pattern is achieved.

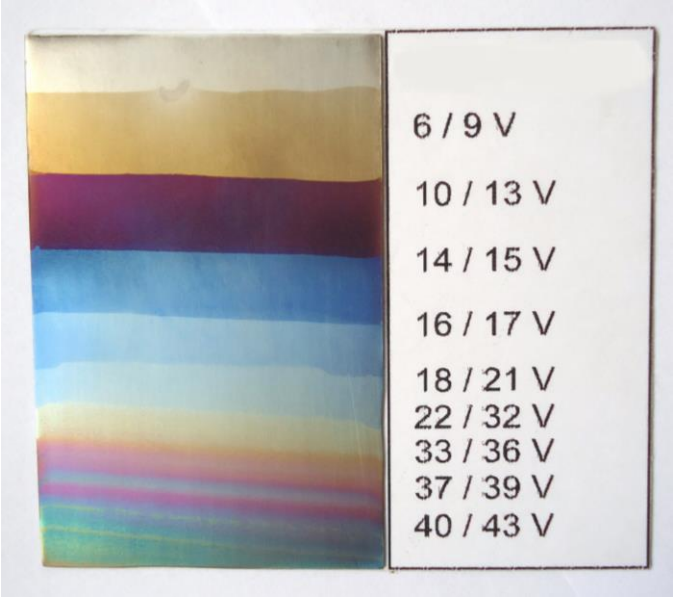
Removing Anodize From Titanium

A solution of 1 tablespoon household lye (available in grocery stores) to 1 pint water should remove anodize in approx. 1 minute. **CAUTION: ALWAYS ADD THE LYE TO THE WATER. NEVER ADD WATER TO LYE. DOING SO COULD CAUSE AN EXPLOSION OR SPLASHING OF CONCENTRATED CORROSIVE LIQUID. ALWAYS WEAR RUBBER GLOVES, EYE PROTECTION, APRON AND USE IN WELL VENTILATED AREA. DO NOT INHALE FUMES.**

Troubleshooting

Problem	**Solution**
Part Does Not Change Color	1. Bad Electrical Connection. Check with multimeter 2. Part is not a reactive metal (ie Stainless Steel won't anodize) 3. Protective finish on metal. Remove whatever finish is on there.
Part Does Not Anodize in areas Fingerprints in anodize	1. Part is not clean enough. 2. Did not wear gloves before anodizing 3. Remove anodize layer, re clean and re-anodize

Titanium Voltage Chart



Niobium Voltage Chart