



## DIRECTIONS: Union Etchants' GoldEX Kit™

### What this kit contains:

- One bottle of AU-1\* Gold Etchant (235 grams)
- Three Gold-plated 1.12" x 2.25" metal coupons
- One bottle of GoldOut™ (97 grams)
- One packet of pre-treatment cleaning powder (contains Alconox®)
- One set of plastic tweezers

\*AU-1 is a UN1759 corrosive powder and a UN1760 corrosive solution upon dilution. Follow all applicable federal, state and local regulations when handling.

### What supplies you will need:

- Gloves and goggles (please read accompanying material safety data sheets for all three components)
- Two small (500mL) and one large (1500mL) laboratory-grade beakers\*
- Glass stirring rod
- Deionized water and plastic dispensing bottle
- Paper towels

Optional: flask, funnel and filter paper (appropriate for collecting metal fines)  
aloe vera-containing product (to help remove any staining, in the event of spillage)

\*Please ensure that the volume of the large beaker is *at least twice the capacity of the solution* before adding any GoldOut™ (to accommodate product foaming).

### PREPARING THE COUPONS

Empty the entire contents of the cleaning powder into the small beaker. Add warm (**100-120° F**) deionized water until a volume of 250mL is reached, stirring with a clean glass rod until the powder is dissolved. Using the plastic tweezers provided, individually immerse and agitate each of the gold-plated coupons into the cleaner solution for approx. 30 seconds. Remove each of the coupons with the tweezers and rinse with deionized water from the plastic dispensing bottle over the second small beaker, taking care not to handle the gold surface of the coupons. Allow the coupons to air-dry on the paper towels, gold surface face-up (approx. drying time 30 minutes). The cleaner is designed to remove only superficial soils that may interfere with the test results, so the used cleaner solution may be discharged directly to drain.

### ETCHING THE COUPONS\*

In a well ventilated area, empty the entire contents of the AU-1 Gold Etchant bottle into the large beaker. Slowly add warm deionized water until a volume of 1000mL is reached, stirring gently with a *clean* glass rod until all the material is dissolved. Dip and immerse each of the coupons until the desired level of etch to the gold surface is visually achieved (a ten-minute immersion is often enough to demonstrate the technology). Remove the coupons from the etching solution.

\*Heating the solution further (maximum 180° F) will increase the rate of etch.

### EXTRACTING THE GOLD\*

Slowly add the GoldOut™ to the etching solution while stirring with a *clean* glass rod. You will notice some effervescence, followed by a color change when the reaction is complete (dark red to pale yellow in approx. 30 minutes). The precipitate containing the gold will begin to settle-out in five to ten minutes, and can be removed later from the solution by standard gravimetric filtration (optional). The clarified Etchant/GoldOut™ solution should be disposed of in accordance with all federal, state and local regulations for hazardous waste (pH of 6.5 ~ mildly corrosive).

\*Enough GoldOut™ has been supplied to process 1000mL 'spent' AU-1 etch solution.

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Note: the above patent-pending chemicals, demonstrating iodine etching as an effective but less toxic alternative to cyanide etching, are intended for use only as specified in this kit. The manufacturer is not responsible for any other unauthorized use, including the addition/mixing of other substitute reactants. For more information, please contact Union Etchants International (UEI) at Tel.: 781-935-8878, Fax: 781-932-8284 or E-mail: [unionetch1@rcn.com](mailto:unionetch1@rcn.com).