



Gold Smith

User's Guide



A Guide for Bench Top Brush and Fine Select Plating With:

24K Gold

Gold Plating Services

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Welcome

Congratulations on purchasing your **Goldsmith Gold Plating Kit**, bench-top plating system. With the Goldsmith Gold Plating Kit you will be able to easily set-up and perform many important plating operations that are not feasible with many other plating systems. The Goldsmith Gold Plating Kit was designed to meet exacting specifications. This allows for professional plating results within a self contained, easy-to-use system.

First:

You should read the safety section of this manual, including the Safety Data Sheets.

Second:

Before using your kit, we recommend that you read the rest of the manual to learn about the features and components of the **Goldsmith Gold Plating Kit**. After you have familiarized yourself with the plating process using your new system, you should decide on some practice items similar to your intended application. Once you see how simple bench-top gold plating is, you can begin your work.

Safety

The person using the Goldsmith Gold Plating Kit should read this safety section completely before beginning operation of the Goldsmith Gold Plating Kit. The user should review and understand the Safety Data Sheets (SDS) for all the products being used prior to using the Goldsmith Gold Plating Kit - plating system. The “SDS” sheets should be kept in a location that will make them readily accessible in the event of accidental exposure or spillage of the product.

Using your Goldsmith Gold Plating Kit safely depends on following a few simple safety rules. While we have taken extensive measures to protect the user, there are several common sense rules that are important to follow in using your Goldsmith Gold Plating Kit plating system.

Personal Protection

The first safety consideration is the use of proper personal protection equipment such as a face shield, safety goggles or safety glasses. Whichever you choose, it is imperative that the solution is prevented from getting into the eyes. Should this happen, the eyes should be flushed with water and medical attention received as indicated on the Material Safety Data Sheet for the product that caused the exposure. We recommend the use of rubber or latex gloves to prevent contact of the solutions with the skin. It is also advisable to use chemical resistant sleeves and an apron to protect clothing since it is possible that some of the solutions can damage clothing. Certain processes such as electro-cleaning and activation and some plating operations can produce corrosive vapors that may irritate the eyes, nose, throat and skin. Use of the Goldsmith Gold Plating Kit should be done in a well-ventilated area. The use of a fan to disperse vapors can reduce the risk of excessive exposure to corrosive vapors.

Handling Chemicals

The chemicals you will be using with your Goldsmith Gold Plating Kit are serious electroplating solutions that if improperly handled could provide a significant risk to personal health and safety. The solutions are either a corrosive or toxic liquid or in some cases, both. Improper use of the solutions provided with your Goldsmith Gold Plating Kit could lead to serious injury or death. Any of the solutions provided could be harmful or fatal if swallowed and can cause serious chemical burns to exposed skin. These solutions are intended to be used by responsible, trained adults. The person using the Goldsmith Gold Plating Kit should read this safety section completely before beginning operation of the Goldsmith Gold Plating Kit. This Safety section includes the appendixes containing the Material Safety Data Sheets, (SDS) for the chemicals that come with the system. These sheets will inform you of important aspects of the chemicals that you will be using.

Chemical Storage

The chemicals provided with your Goldsmith Gold Plating Kit plating system and the rinse water generated by using the Goldsmith Gold Plating Kit must be properly stored in a secure, cool location that is not accessible to children or other un-authorized persons. Never store any of these solutions in un-marked containers or in any container that could lead to improper use or disposal of the solutions or rinse water. The rinse water produced by the plating operation is a hazardous material and must be collected, stored and disposed of in accordance with all local, state and federal laws or local provincial laws or regulations. If you are unsure of the applicable laws you can check with the local water reclamation district (sanitary sewer district), local, state or provincial environmental health authority, and the federal Environmental Protection Agency.

Electrical Hazard

In the event of failure of the Goldsmith Gold Plating Kit to operate as indicated in this manual, call Gold Plating Services for recommendations on how to proceed. **Do not open the console, there are not any user serviceable components inside; opening the unit will revoke the warranty.**

Make sure your Goldsmith Gold Plating Kit power supply is connected to the appropriate outlet to provide the correct AC voltage as indicated on the back of the wall adaptor. Only use the wall adaptor unit provided by or as approved by Gold Plating Services. If the Goldsmith Gold Plating Kit is going to be used near fixed plumbing we recommend that the outlet be “Ground Fault Protected”. The plating voltages provided by the application handles are normally very low, usually less than 5 volts direct current. However the wall adaptor is normally connected to an outlet which could provide electrocution risk when the unit is connected or disconnected from the wall outlet if proper caution is not exercised.

Storage Of Chemicals When Not In Use

One of the most beneficial features of the Goldsmith Gold Plating Kit is the ease with which it can be put away for short or long term storage when not in use. If you expect to use your Goldsmith Gold Plating Kit within the next week or two then you should just make sure the lids on the solution beaker are on and tightened and clearly marked. For longer term storage of solutions, we recommend they be returned to the original container and sealed tightly. In the event the 24K brush plating gold solution gets too dry, the consistency can be restored by adding a few drops of distilled water, replacing the lid and shaking to mix the paste to the desired consistency.

During the colder seasons some of the components of the liquid gold solutions can come out of solution and form crystals in the bottom of the container. Before using the 24K Pen Gold Solution for the first time we recommend warming the solution to at least 100° F, (slightly warmer than body temperature). Warming can take place near a warm lamp, heater vent or other warm area. Be careful not to overheat the solution or the container. The solution just needs to be warm. When the solution is warm, shake the solution to help the crystals that may have formed re-dissolve. You can see that the solids are all in solution by holding the jar up to the light and looking for sediments near the bottom. Making sure all the components are completely dissolved will ensure the best results.

Safety Data Sheets

The Safety Data Sheets (SDS) for the solutions provided with your system are supplied as an appendix to this manual. If you order other chemical products, be sure to ask for the appropriate SDS. You should keep the SDS information for the chemicals you use in a location that is readily accessible to the user of the *Goldsmith Gold Plating Kit*.

Setting Up the Gold Smith

When brush plating, the handle holding the plating solution and the solution have a positive (+) electrical charge relative to the work. Generally speaking, the activation step indicated below is rarely required. If the surfaces to be plated are dirty or visibly corroded then you will need to polish and clean the surface to be plated. It is imperative that the surface is free of any corrosion.

1. Plug the combination handle and red lead into the red (+) output port and the black common lead with an alligator clip into the black common output port.

2. Plug the AC wall adaptor into a suitable outlet and insert the other end into the DC connector located on the back of the Goldsmith Gold Plating Kit Unit;



3. Turn on the power switch and check to see that the red power indicator light is on.

4. Adjust the voltage control until the indicator line on the output control knob is set to 50% plating range, as shown.

- Too high of a voltage setting can cause the gold deposit to be dark brown and dull.

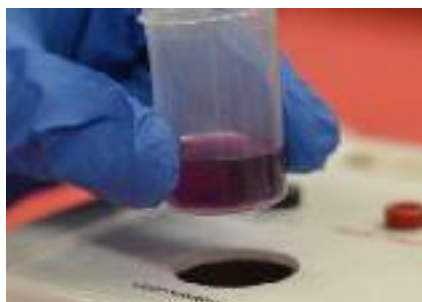
- Too low voltage will cause the gold to plate slowly.

- It is also **important** to keep the application sleeve or pen plating tip moving over the work during plating. **Stopping can "burn" the gold.** "Burning" is the commonly used term for a dark or dull gold deposit caused by too high

plating voltage. If this happens, you can easily polish it out with a little baking soda mixed with water.



5. Dispense the solution you will be using into the working beaker. You should only fill the working beaker with a small amount of solution since having too much solution in the working beaker can cause you to waste the solution. Since the solutions tend to dry out more quickly in the working beakers, you should only dispense the amount of solution you will be using.



The normal level for the working beakers is about ½" Brush Gold Liquid

6. **You will need to pre-soak your working sleeves on the bit in the plating solution. (Do not remove plastic zip tie from bottom of the sleeve)** Before the sleeve/solution will be conductive, the working solution must have soaked through the sleeve to the stainless steel bit. **Make sure your sleeve is thoroughly soaked with distilled water prior to installing onto the stainless steel bit.** Pre-soaking the sleeve with distilled water is normally done by working the water into the sleeve by squeezing with your fingers while pouring distilled water over the sleeve. Pre-soaking will reduce the amount of time it takes for the solution to soak through a new dry sleeve. When you get your kit for the first time. We do include a pre-soaked gold sleeve to speed up the process.

The first time the felt Pen Plating tips are used, they need to soak in the pen plating solution in the gold solution working beaker for at least 10+ minutes prior to use. This will allow the gold solution time to soak up the tip and make contact with the handle. Once you have used a tip, you should pull it from the handle and allow it to dry out. Once a tip has been used it will soak up the solution and be ready to use almost immediately upon contact with the solution.

7. Slide the bit into the pre-soaked sleeve. (Do not remove plastic zip tie from sleeve)



Install the bit into the application handle. Only about an inch of the bit will fit into the handle. Twist the red tightening screw snug; do not over tighten. Then place the end of the bit with the soaked sleeve into the working beaker with the solution.

Beginning the Plating Process

Surface Preparation and Cleaning

There are two very important rules for preparation of work in any electroplating operation. The first is pre-finishing. Pre-finishing involves preparation of the surface prior to the plating process. The pre-finishing process determines the degree of quality of the finished plate.

The second rule for preparation of work to be plated is to ensure that once the surface has been polished to the desired luster and quality of finish, the surface is made accessible to the plating process solutions. What this means is that the surface is absolutely clean, completely free from grease, oil or dirt and free from significant oxides and any other surface film. This crucially important step can be a little tricky because many of the

methods of polishing can actually leave trace deposits that can seriously affect one or more of the plating processes.

Before plating begins, the surface should be carefully inspected to make sure the water sheets off evenly and doesn't have any areas where the water beads up. If the water beads up in any area then the part must be cleaned again or electro-cleaned.

Generally, electro-cleaning is only performed when the part is exceptionally dirty or oily.

In summary:

1. The finish of the pre-plated part should have the luster and brightness that you will be expecting in the final finish.
2. The part must be absolutely clean before you can begin the plating process.

1. **Brush plating with the sleeve and 24K Brush Gold Solution** –The surface to be plated should be clean and free of grease dirt or other material that could prevent adhesion of the gold. If the parts are dirty or corroded after normal cleaning, the surface should be polished or cleaned to expose the clean substrate.

Note: Most clean bright surfaces can be plated without additional activation or pretreatment, however, some surfaces require special pretreatment or activation. These surfaces include stainless steel, chromium and old nickel finishes. Most copper alloy surfaces need to be shiny and bright and may benefit from activation or underplate. Some surfaces such as aluminum or zinc cannot be plated with this system without extensive under plating and or additional pretreatment that might not be able to be performed with this system. If you are having trouble plating onto a particular finish you should call Gold Plating Services' technical support for information on how to handle your specific case.

2. When you are setting up to plate you want to find an area that is comfortable with sufficient light. Most people like to have some local ventilation although there are not extensive fumes or vapors produced. You need to make electrical contact with the area you want to plate by attaching the alligator clip from the black common lead to it.
3. In this picture, we have clipped the pendant with the alligator clip from our black common lead. We will be brush plate this pendant with the 24K Brush Plating Gold Solution.



Note: If the area under the alligator clip is to be gold plated. You will need to reposition the clip in another spot during plating. A good technic is to move it about 3- 4 times in different locations on the item being plated during the plating process. This will allow a more even deposit of gold.

4. Plate the area with gold by lightly rubbing the gold sleeve over the surface in small circular motion with very light pressure. **Don't stop moving the sleeve or let it rest in one spot; this can cause the gold to form a dull brown deposit.** We call this burning. It is easy to fix burned gold but it is better if you don't have to.
5. When the gold becomes opaque it is approximately 3 micro-inches thick. After that point it is impossible to determine the thickness visually. To insure the most uniform thickness of around 10-12 micro-inches you should plate about 3 to 4 times as long as it took for the original opaque deposit.

Example: Plating a Quarter

Opaque 3 micro-inches thick = 10-15 seconds

Opaque 10-12 micro-inches thick = 30-50 Seconds

Note: The time it takes for the gold plating to appear opaque on an item being plated is determined by several different factors including the size, the material it is made of, the voltage used to plate, and the saturation of the sleeve.

6. When finished rinse off your gold piece so that no solution is left on it.

Did the Gold Adhere to my Item?

When finished rinse off your gold piece so that no plating solution is left on it. Once the item is dried you can check to see if the gold adhered to the item by simply placing a piece of scotch tape on the gold and pulling it off. If no gold came off with the tape it has adhered to the item.

If the gold came off onto the tape it did not adhere to the item correctly. You will want to buff off the item with a hand cloth or buffing wheel. Then, carefully review/repeat the steps to make sure it adheres the next time. If you have any questions about this, please feel free to call our Technical Support Line.

Fine Select Plating with “Pen Gold”

Using the Fine Select Plating tips will enable you to provide very detailed select plating. Gold Plating Services’ brush plating solutions must have high metallic content. The high metal content also requires a higher concentration of the brighteners. In order to make sure that all of the components stay in solution, it is important to have the container warm (90 - 100 ° F or 38° C) prior to dispensing into the working beaker. Shake the warm solution and then dispense about ¼” of solution into the working beaker as indicated above.

The fine select felt tips come in two sizes, fine and medium. Begin by inserting the tip you want to use into the end of the application handle. The tip will fit tight and should push in about ¼”.



After the tip is inserted into the application handle the tip must soak in the 24k Gold Brush Plating Solution until it is completely soaked through, normally 5-10 minutes for the first time used. Set the application handle into the gold solution working beaker.



When you pull the application handle out of the working beaker for use, let the excess solution drip off back into the working beaker. There is a lot of gold in that solution – don't waste it!

The fine tip will plate extremely high resolution such as the head of a quarter or a single finger on a printed circuit board as shown here. See picture to the Right.

With the quarter, we are “grounding” the part by holding the quarter in the alligator clip on the common lead. For small areas such as a single finger of a printed circuit board, you can use a steel or copper probe to ground the surface to be plated.

Note: If the area under the probe is to be plated too; you will want to reposition it throughout the plating process.



The part you are going to selectively plate should be perfectly clean and polished to the brightness and luster you want in the final finish. For gold, you should adjust the output control between **50 – 60%**. The higher the voltage, the faster the gold will go on, however, with the voltage set higher in conjunction with the highly concentrated solution and small current area it is possible to burn the parts if you stop moving the tip over the part or if you apply excessive pressure. With a little bit of practice, you will soon learn the best voltage setting for your project. You should plate with as high of voltage as possible without burning. That point is determined by the size and shape of the part, how much you move the tip during plating and the temperature. **If you “burn” the gold, it will have a dark brown, dull appearance.** Don't worry; it is easy to fix with a little baking soda (sodium bicarbonate) powder mixed with water into a paste. Brush the burned gold lightly with a toothbrush or soft cloth and the dark appearance will polish to a bright gold finish and then back the voltage down a little.

When you are plating the part, don't apply too much pressure on the tip. Some people like to feel like they are rubbing the gold on. Think of using the tip to control the “puddle” of gold solution and continuously move the tip in circular motion over the part. When you are working up to an edge where you want the plating to stop, you can tip the work so the edge or line you are working to is higher than the tip, then it is very easy to control the puddle. When the gold just becomes opaque, the thickness is around 3 to 5 micro-inches. For a typical gold plate you should apply 4 to 5 times that much. With practice and a methodical approach it is easy to apply reasonably consistent plating with adequate thickness.

We suggest that you practice on items similar to the work you want to perform to get the feel of the plating process. If you have special questions or applications you aren't sure of feel free to call our toll free technical support line (801) 546-6200, or e-mail info@goldplating.com .

Goldsmith Gold Plating Kit

Limited Warranty

Gold Plating Services Inc., (Seller), warrants the Goldsmith Gold Plating Kit internal components and external AC Wall Adaptor to be free from defects in material and workmanship for a period of one, (1), years from the date of purchase. If the internal components or the AC Wall Adaptor should prove defective in the material or workmanship Gold Plating Services, at its sole discretion, will repair or replace the defective item. Service under this warranty can only be obtained by receiving a warranty return authorization and then delivering or shipping the equipment with all shipping or delivery charges prepaid to:



Gold Plating Services
378 North Main #112
Layton, UT 84041

This warranty does not apply to the application handle, leads, power connectors, application bits, application sleeves or accessory components. This warranty does not apply to corrosion or shell damage caused by user failure to clean as required. This warranty does not apply to damage caused by accident, misuse, abuse, or neglect.

Gold Plating Services makes no express warranties, including any warranty of merchantability or fitness. This warranty expressly excludes all incidental and consequential damages. (Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitations or exclusions may not apply to you.) This warranty gives you specific rights and you may have other rights that vary from jurisdiction to jurisdiction.

Warning: The individual user should take care to determine prior to use whether this device is suitable, adequate and safe for the use intended. Since individual applications are subject to great variation, the manufacturer makes no representation or warranty as to the suitability or fitness of this equipment for any specific application except as explicitly described in the written material provided by Gold Plating Services Inc.

Goldsmith Gold Plating Kit Warranty Revised 07/22