

User's Guide

For Bench-Top Brush Plating With;



Copper



Nickel



24K Gold

Welcome

Congratulations on purchasing your Universal Plater bench-top plating system. With the Universal Plater you will be able to easily set-up and perform many important brush plating operations that were not feasible with any other plating system. The Universal Plater was designed to meet exacting specifications to allow professional plating results with a self contained, easy-to-use system.

First;

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

Second;

We recommend that you read this manual to learn about the features and components of the Universal Plater. 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 brush plating is, you can begin your work.

Safety

The person using the Universal Plater should read this safety section completely before beginning operation of the Universal Plater. The user should review and understand the Safety Data Sheets (SDS) for all the products being used prior to using the Universal Plater bench-top plating system. The “SDS” information 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 Universal Plater 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 Universal Plater 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 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 Universal Plater 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 Universal Plater plating system are serious electroplating solutions that if improperly handled could provide a significant risk to personal health and safety. The solutions are either corrosive or harmful if ingested or in some cases, both. Improper use of the solutions provided with your Universal Plater could lead to serious injury or death. Any of the solutions provided could be harmful or fatal if swallowed in sufficient quantities and could cause serious chemical burns to exposed skin if not washed after exposure. These solutions are intended to be used by responsible, trained adults. The person using the Universal Plater should read and understand this safety section before beginning operation of the Universal Plater. This Safety section includes the appendixes containing the Safety Data Sheets, (SDS) for the chemicals that are provided 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 Universal Plater plating system and the rinse water generated by using the Universal Plater 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. If you are unsure of the applicable laws

you can check with the local water reclamation district (sanitary sewer district), local or state environmental health and/or the U.S. Environmental Protection Agency.

Electrical Hazard

In the event of failure of the Universal Plater power supply to operate as indicated in this manual, call Gold Plating Services for recommendations on how to proceed. Do not open the power supply or control console, there are not any user serviceable components inside. Opening the unit can revoke the warranty.

Make sure your Universal Plater power supply is connected to a safe, properly wired supply outlet. If the Universal Plater is going to be used near fixed plumbing, we recommend that the outlet be “Ground Fault Protected”. The plating voltages are normally very low, usually less than 5 Volts direct current. However, the wall adaptor is connected to the supply outlet which can expose the user to dangerous voltage if the unit is connected or handled improperly.

Storage of Chemicals When Not in Use

One of the most beneficial features of the Universal Plater is the ease in which it can be put away for short or long term storage when not in use. If you expect to use your Universal Plater within the next week or two. You should make sure the lids on the solution beakers cells are tight. For longer term storage of un-contaminated solutions, we recommend that you return the solutions to their original containers and seal tightly.

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 *Universal Plater*.

Copies of our Safety Data Sheets (SDS) are available online at www.goldplating.com under resources.

Set-up the Universal Plater



With normal brush plating, the handle holding the plating solution and the solution have a positive (+) electrical charge relative to the work. The work is connected to the control console with the common lead. When properly connected and the power is in the “ON” position all three of the output ports will provide a positive (+) electrical charge. The voltage will be indicated on the Output Meter.

We have included a Quick Start Guide and a sample item for you to test out the steps prior to going onto other work. If you no longer have the quick start guide, we have included the same information in the following detailed steps. **We highly suggest gold plating a sample item that is similar to work you want to perform. This will give you a better idea of what to expect.**

1. **Setup-** Plug the combination handles and leads into the matching color coded (+) ports on the top of the console. Then plug the black common lead with an alligator clip into the black (-) output port located on the Right side of the console.

Note: You may not need to use all three handles and all solutions every time you plate. This will vary depending on the process you are performing .

2. **Connect to Power-** Plug the AC wall adaptor into a suitable outlet and insert the other end into the DC connector located on the back of the Universal Plating Console. The Wall Adaptor will accept AC input voltage from 100-240 VAC, 50-60 Hz.



3. **Power On-** Turn on the power switch and check to see that the red power indicator light is on and the meter display is illuminated.

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. After the sleeves have been used for the first time it is not necessary to pre-soak again. The sleeves can be re-used for the same solution until they wear out. The first time the felt Pen Plating tips are used, they need to soak in the pen plating solution in the small working beaker for at least 10 minutes prior to use. This will allow the 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. **(You could store the tips in a small zip lock bag but not required)** Once a tip has been used it will soak up the solution and be ready to use almost immediately upon contact with the solution. **Note: It is not necessary to rinse tips after use.**

8. Slide the bit into the pre-soaked sleeve. **(Zip Tie sleeve Securely)**



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.

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.

If a high polish is desired in the finished plate, then the surface must be polished to a high polish at this time. If a textured finish is what you want then now is the time to apply the texture you are looking for using some abrasive method such as light sanding, scotch bright pads etc.

The second rule for preparation of work to be plated is to insure 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. **The surface must be absolutely clean, completely free from grease, oil, dirt, and free from significant oxides or 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. We recommend cleaning the part with hot and soapy water to remove most residue. Then follow with electro-cleaning.

Before plating begins, the surface should be carefully inspected to make sure rinse water sheets off the surface evenly without 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. Electro-cleaning is an excellent final cleaning step that will help the surface to wet out. **Note: You should see a slight foaming/gassing when electro-cleaning, this is normal.**

Deciding on a Procedure

After you have pre-finished and washed your part you will need to decide on the plating procedure to use. Our rule of thumb is not to include any more steps than is necessary to achieve the desired result.

For example, if you are planning on gold plating new, clean coins you could choose a process that involves electro-cleaning, activation and gold plating. However, it is very possible that you could simply gold plate directly onto the new coin without any other pre-treatment. It is important to avoid touching the surface you will be plating since skin oil can show in the gold plating or reduce adhesion.

We suggest you do some trials to determine the simplest process you can use to get the results you want. How many of the handles and which solutions you will be using depends on the plating process you will be doing.

What Handles/Solutions Should I be Using?

Before setting up your Universal Plater you need to decide on how you plan to plate your work. For many gold plating projects, you will only need to set up the gold plating handle. For other projects you will also want to set up an activation handle or a handle for other plating solutions. Since all of the handles receive the same voltage and polarity and are identical in their operation, the color of handle you use for any function is a matter of choice. Our recommendation on which handle to use for a specific function is probably a good place to start. In time, you may develop preferences based on the work you do.

Example: If you are going to perform fine select 24K gold plating onto new silver or nickel alloy coins then you will only need to use one of the application handles and it is likely that the only solution you will need is the 24K Pen Plating gold solution. We normally recommend using the RED handle for the gold plating application.

If your application requires that you plate the surface with a series of copper, nickel and 24K gold then you will need to set up all three application handles with the plating solutions and adjust the voltage for each of the solutions as your plating progresses.

A very common setup uses a pre-treatment process including electro-cleaning and surface activation followed by plating. Make sure to rinse thoroughly with distilled water between processes.

In this case we would recommend that the blue handle be used for electro-cleaning with the electro-cleaner solution being placed in the solution beaker immediately in front of that handle. The surface activator solution would be placed in the beaker in front of the green handle. The plating solution will be placed in the solution beaker in front of the red handle. Note: The small solution beaker is used for fine select plating. (Usually for pen gold.)

Blue- Electro- Cleaning

Green- Surface Activator

Red- Plating Solutions

Brush Plating with the Sleeve & 24K Brush Gold Solution

Is the Surface on the Item Ready for Plating?

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, bare metal.

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.

Where Should You Set Up for Plating?

When you are setting up to plate you may 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.

How to Make Electrical Contact with the Item Being Plated

You need to make electrical contact with the area you want to plate by attaching the alligator clip from the black common lead.

In the 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.

In some instances, there may be items or areas that you want to plate that you will not be able to attach the alligator clip to it. The item/area will not plate if it does not have the proper (-) electrical connection. In these situations a probe is used to make this connection in most of these circumstances. You will want to connect the alligator clip to the probe. Then use the probe to touch the surface area of the item being plated.

Note: On some items, for example: PC Boards and Switch Boards, you may be able to touch a different area to give the required (-) electrical connection.



* This kit does not include a probe. They can be purchased online at our website or by calling our customer service department.

How to Start Brush Plating

Plate the area with gold by lightly rubbing the solution soaked 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. “**Burning**” is the commonly used term for a dark or dull deposit caused by too high plating voltage or by stopping your sleeve. If this happens, you can easily polish it out with a little baking soda mixed with water using a soft rag.

How Long Should I Plate the Item?

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.

Did the Plating Adhere to my Item?

When finished, rinse off your piece so that no plating solution is left on it. Then dry with a paper towel or soft cloth. Once the item is dry you can check to see if the plating adhered to the surface by simply placing a piece of scotch tape on the surface and quickly pulling it off. If no plating came off with the tape, you have good adhesion.

If the plating 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.

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 (801) 546-6200, or e-mail info@goldplating.com.

Basic Process of Gold Plating onto a Nickel Surface

The following steps we will explain how to successfully gold plate onto a nickel surface. At this point you should have followed the surface preparation and cleaning steps. Your item should have the desired quality and luster you want in the completed look. The piece should be cleaned so that the item is free of grease, oil and dirt.

Step 1- Electro- Clean (Blue Handle)

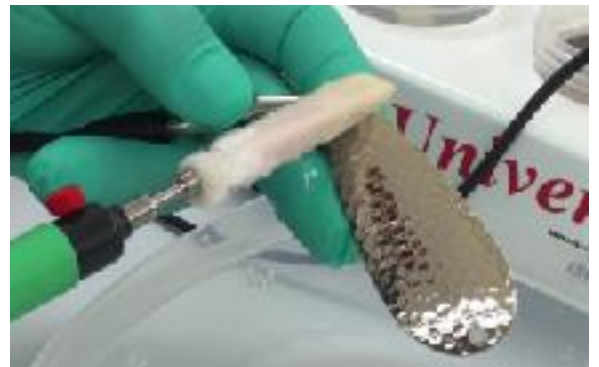
Any polishing or cleaning should be done prior to electro-cleaning. The first step is to prepare the item for the pretreatment and plating process. The purpose of the electro-clean step is to make your the surface wet out. If you were to take water and pour it over your item before performing electro-plating the water would bead up like water would on a waxed car. After performing the electro-cleaning step pour water over your item again. If the water sheets off the item evenly with no water breaks or beading up you have successfully completed the electro-clean step. If there is an area that still beads up, redo the electro cleaning process in that area again before moving to step 2-Surface Activation. Once sufficiently electro- cleaned the item should stay wet and have no areas with water breaks or beading.



Step 2- Surface Activate (Green Handle)

The way a lot of people like to think of the surface activation step is similar to using primer or an etch. Although it does not etch it, it will remove any oxide or material that would effect the adhesion. If you were to skip the activation step this could effect your item in different ways during the plating process. One being the plating may go more slowly and two being that it may effect the adhesion. You want to make sure that whatever you are plating will adhere to the item.

* Make sure to rinse your item with distilled water between each step.



Steps 3- Gold Plate (Nickel, Copper, Rhodium, or Rose Gold Plate) (Red Handle)

Before you plate your item check the suggested voltage range. As you gold plate this piece using the brush plating sleeve over the stainless steel bit we gently move the sleeve in a constant circular motion to avoid burning the gold. For the time it takes the item to appear opaque you will continue to plate about 3x as long so that you reach the desired thickness you like to achieve.

*Once you have completed the plating step rinse your item off with distilled water.

*If burning occurs you can easily polish it up using baking soda and water in a paste form. Use a soft rag and gently rub until desired finish.



Fine Select Plating with Pen Gold

Using the Fine Select Plating tips will enable you to provide very detailed select plating. Gold Plating Services' select plating solutions must have extremely 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.

How to use the Fine and Medium Tips

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 pen plating gold 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 are plating the area, 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 area you want plated. 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

How to do Fine Select Plating

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.



Note: If the area under the alligator clip or Probe is to be plated. Simply reposition it during the plating process.

For small areas such as a single finger of a printed circuit board, we have a stainless steel probe to be used to ground the surface to be plated.

Where to Set Your Voltage

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.

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.

Note: 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.

How Long Should I Plate my Item?

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.

Example: Plating the Head of 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.

Note: With fine select plating you use the 24K Pen Gold Solution which has a higher concentrated amount of gold. So the gold will almost instantly appear opaque.

Additional Plating Resources and videos can be found on our website goldplating.com and on our Youtube Channel - Gold Plating Services

Our current plating procedure chart can be found on our website under Tech Support. These are recommended voltages and times that will vary. We suggest starting at the lower end of the suggested voltage range and work your way up to fit your projects needs.



Universal Plater

Limited Warranty

Gold Plating Services Inc., (Seller), warrants the Universal Plater internal components and external AC Wall Adaptor to be free from defects in material and workmanship for a period of one, (1), year 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.



Universal Plater Warranty Revised 05/22