



TIFOO

Tank plating set - "basic" and "starter"

MANUAL

Tank plating equipments



Tank plating set - "basic"



Tank plating set - "starter"

TANK ELECTROPLATING - THE METHOD FOR BRILLIANT RESULTS

The bath electroplating system offers you the opportunity to perform on your own unique and robust gold, silver and other precious metals coatings. Bath electroplating is easy to handle and provides a uniform coating of surfaces.

There are two variations:

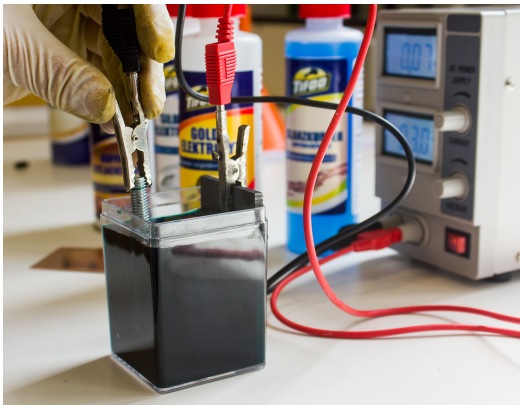
- 1.) The bath electroplating Basic set, which provides you the basic equipment without electrolytes and
- 2.) the bath electroplating Starter set which includes also three different electrolytes.

BEFORE STARTING

Find first a suitable place to perform the bath electroplating. It should be a place where you don't store any kind food (which might get contaminated) and should be a well ventilated room. A hobby room or a garage workshop would be fine.

A central component of any bath electroplating sets is the power supply which operates on AC power (220 volts). On the power supply there are two displays, one for the voltage (in volts "V") and one for the current (in amperes, "A"). Both can be tuned with the corresponding knob.

Below are 2 sockets. One is red and represents the (+) - Pol (the „anode“), the other socket is black and represents the (-) - Pol (the „cathode“). From those it is possible to obtain DC current as output. The two knobs allow tuning the voltage (0-15 V) and the current (0-3 A). Next to them is the main switch, to turn on and off the power supply. Other accessories include the matching jack cable in red and black and matching alligator clips. The clips are plugged at the other end of the corresponding cable. The two plates are a graphite anode and a copper anode. The proper anode will be later connected to the red cable, depending on the application. The plastic container is used as a plating bath.



EXAMPLE: GOLD PLATING A BOLT (STARTER SET)

Caution: always wear protective goggles when handling chemicals! Turn off the power supply. Connect the red wire to the red socket and the black wire to the black socket. Then connect the alligator clips to the terminal end of the red and black cables. Place the graphite anode in the plastic container and clamp it to the red wire.

On the next step you have to clamp the screw to the black wire and place it in the container as far as possible away from the graphite anode. The screw has to be previously carefully cleaned and degreased. Fill now the container with electrolytic solution. The screw must be completely immersed, as only the part of the object that comes in contact with the electrolyte will be plated. Turn then both controllers of the power supply completely to the left (no voltage and no current) and switch on the power supply unit. Both displays are now at zero. Now there are two ways for adjusting properly the voltage and the current: one is the voltage-controlled setting, the other is the current-controlled.

The **voltage control** is recommended if the surface area of the work piece cannot be easily determined (for example for a gold chain) or with special electrolytes such as nickel and silver,

whereas the **current control** is recommended when a current density is specified for the electrolyte and the surface area can be easily determined, for example for a metal sheet or a coin.

In this example, we are working with voltage control, since the surface area of a screw is quite difficult to determine. Turn the current controller (Ampere, „A“) to the maximum. There is still no current. Then turn slowly the voltage controller (Volt, „V“): increasing the voltage, the current increases. In the example, the gold plating works very good with a voltage of 3.0 V. The longer the screw in the electrolyte the thicker the layer of gold will be. Decorative gold plating creating a thin layer needs 3-5 minutes.

After 3 minutes, the screw can be removed from the bath and is now nicely gold plated (see picture).



Now switch off the power supply and remove the anode and the screw from the vessel. Wash the plug, the alligator clips and the graphite anode with water. The electrolyte can be reused several times.

Pour the electrolyte back in the bottle.

If you would like to carry out the process in current control, proceed as follows (for example for gold plating of a copper sheet):

- 1) Calculate the surface area, in this case, $6 \text{ cm} \times 5 \text{ cm} = 30 \text{ cm}^2$
- 2.) The current density required is $3 \text{ mA} / \text{cm}^2$ (refer to the instructions of the electrolyte, each electrolyte requires a specific current density)
- 3.) $30 \text{ cm}^2 \times 3 \text{ mA} / \text{cm}^2 = 90 \text{ mA} = 0.09 \text{ A}$

Adjust the voltage controller to zero and turn up the current controller until the current display indicates 0.09 A. The voltage increases automatically.



ANODES

The graphite anode can be used for the silver and gold electrolytes. Only use the copper anode for the copper electrolyte. We recommend to use fine silver anodes with the silver electrolyte (01-94-00000).

HELPFUL HINTS

The clamping of the objects can sometimes be a bit difficult. Here you can use, for example, additional clamps, called spring clamps, which are available in hardware stores. If you deal with longer and more frequent electroplating we recommend you our electroplating plant Deluxe with magnetic system. In this system the objects can be easily suspended in the electrolytic solution from above.

Avoid too high voltages and currents, as these cause uncontrolled metal depositions - the work pieces might thereby become dark and unsightly. With proper compliance with the voltage and current density and some practice you'll get impressive and beautiful results. Electroplating is perfect for creating little gifts and for jewellery.

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