MICROPLATE INSTALLATION & ELECTROPLATING GUIDE

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Manufacturing processing equipment since 1969

COMPONENT PARTS OF YOUR MICROPLATE

Check you have the following component parts.

Processing machine
2 x Stainless Steel strip anodes
1 x Platinised Titanium mesh anode
3 x covers for the baths

You will also require the following materials.

2 litres of distilled or deionised water (water for car acid batteries is suitable)
Electrocleaning salts
Gold plating or gilding salts
Rhodium concentrate and 10ml of PURE Sulphuric acid or 1 litre of ready made Rhodium solution
About 10 cms of Copper, Brass or Silver wire
Electrical plug connection
2 x plastic or glass containers to hold rinse water of about 1 litre, or easy access to running water

After checking that you have all the above parts, place the MICROPLATE in a suitable level position. Ensure that the place you will use your machine is able to support the full weight of around 20 kgs of a full MICROPLATE.
Place the 2 rinse containers filled with tap water near to the MIRCOPLATE.

Installation

1. Remove the 2 anode / cathode bars and the 3 process tanks from the machine.
2. **Fill the inner water jacket ¾ full with water from the tap. THIS IS ESSENTIAL.**
3. Place the 3 process tanks into the appropriate openings.
4. Make up the solutions as follows,
   (a) Electrolytic cleaning tank, left tank, add 50 grams of Electrolytic cleaning salts to 1 litres of tap water and stir for 30 seconds.
   (b1) Gilding solution (thin Gold), middle tank, add a complete 1 litre pack of Gilding salts to 1 litre of deionised water and stir for 30 seconds. It is important that a complete pack of salts is added, as partial additions of larger salts packs cannot guarantee that the quantities of the different components are in balance.
   (b2) If you intend using Hard Gold plating solutions for thick deposits, these are supplied in liquid form and need to be added to the process tank without additions.
   (c1) Rhodium solution, to 1 litre of deionised water, add 10 ml of PURE Sulphuric acid CAREFULLY and stir. Add 2 grams of Rhodium concentrate and stir for 30 seconds.
   (c2) Ready made Rhodium solution needs pouring into the tank without any further additions.
   If you intend using other plating solutions, for example Nickel, Silver or Copper solution, follow the instructions provided with these products.
5. Re-fit the anode and cathode bars, fit the anodes on to the anode bar and into the correct tanks, Stainless steel strip anodes in the Electrolytic cleaner and thin deposit Gilding solution. Platinised Titanium anodes in the Rhodium and Hard Gold plating baths. Additional Platinum coated anodes are available if you require for plating Hard Gold and Rhodium. Do not use the same anode for different processes as contamination of solution will occur. Ensure the anodes fit tightly.

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6. Fit an electrical plug and connect the MICROPLATE to a 220 – 240 volt AC supply able to give 8 amps.
7. Switch the POWER switch to "INTERNAL" and leave the unit for 30 minutes to heat up. Use "EXTERNAL" position if you are using a silica heater and plug the heater into the provided rear socket.
8. New Gilding solutions should be stirred every 15 minutes for an hour to ensure that all the chemicals are fully dissolved.

The MICROPLATE is supplied with the heating control set to give Electrolytic cleaning and Gilding bath temperatures at 60ºC and the Rhodium bath at 40ºC. If you required different temperatures in order to plate Hard Gold in the middle bath, you can adjust the settings by removing the power plug and removing the red heater cap on the left side of the unit. Inside you can adjust the calibrated thermostat. Add 10ºC to the required temperature to allow for heat loss through the bath walls.
If an external ADDPLATE module / Silver bath / Pen plating unit is to be used in conjunction with the MICROPLATE, connect the + and – socket on the MICROPLATE control panel to the external device. Note that anodes and Pens are always connected to the + (Red) connection and work pieces are always connected to the – (Black) connection.

Plating Procedures

To prepare your articles for electroplating, it is important to ensure that all oil, grease, paint or other materials are removed prior to processing. The most common cause of poor quality plating is insufficient preparation.
To remove polishing composition, an ultrasonic cleaner is preferred or vigorous brushing with soapy water is satisfactory.
After pre-cleaning, articles for electroplating are suspended on hooks made from Copper, Brass or Silver wire. If Copper or Brass are to be used with Rhodium it is necessary to plate them first with Gold to prevent contamination of the Rhodium solution.

1. **GILDING (thin gold plating)**
   Place the article in the ELECTROLYTIC cleaning bath, in contact with the cathode bar (black connection) and adjust the voltage to 4 – 6 volts. Ensure the amps drawn do not exceed 10 amperes. You will see the surface of the article start to "gas" this is the electrolytic action that renders the surface chemically clean, ready for electroplating, 10 – 20 seconds is sufficient time to prepare the surface.
2. Remove from the Electrolytic cleaning bath and rinse in water twice to remove all traces of cleaner. Check the surface of the piece to see that there is no "water break" that would indicate a greasy surface, re-clean if in doubt.
3. Place the article in the GILDING solution, in contact with the cathode bar and adjust the voltage to 5 volts and agitate slowly for 5 – 10 seconds keeping the article moving. Allow hidden areas of the piece to be exposed to produce an even colour. Vigorous agitation produces deeper yellow colours.
4. Remove from the Gilding bath and rinse twice in water followed by hot water to help drying.
5. Dry using Maize, sawdust or tissue paper (Kleenex).

Rhodium Plating

he pieces for RHODIUM plating should be prepared for plating by painting off with lacquer (nail varnish) to protect areas where the Rhodium is not required. Because extended time in the electrolytic cleaner may remove the lacquer it is recommended that articles are pre-cleaned, as in steps 1 to 2 and then dried before painting. This reduces the time necessary in the electrolytic cleaner to 5 – 6 seconds.
The process is similar to the Gilding process with the exception of the voltages used in the Rhodium.

1. Electrolytic clean, 5 – 20 seconds at 4 – 6 vols.
2. Rinse a minimum of twice in clean water.
3. Place in the Rhodium bath and apply the voltage based on the size of the article being plated, for example:
   Ring tips / claws = 0.5 – 1 volt. Ring head and shoulders = 1 – 1.5 volts.
   Ring complete = 2 volts. Bracelet / chain = 3 – 4 volts.
   Plating time should be 5 to 20 seconds; excessive plating time will dull the polish and serve no purpose as the hardness of Rhodium is very high.
4. After plating, rinse twice in water, remove the lacquer using a solvent and dry by normal methods.

Rhodium solution is easily damaged by contamination, so clean rinse water is essential, use deionised water if tap water is chlorinated or if Fluorides are added.

Service and Trouble-shooting

Only attempt electrical service if you are qualified and understand electrical safety procedures.
Disconnect electrical supply before removing panels.

1. No rectifier or heating lights – Switch on: check power supply: check fuses.
2. Rectifier reads but no heat – Check 7.5 amp fuse: thermostat in heater cap: check heater for corrosion & operation.
3. Heating working but no volt or amp meter readings. Check 2 amp fuse: check rotation on control is it loose?: check internal rectifier (25 x 25mm module with 4 connections fitted to the aluminium heat sink, next to the 2 transistors): Check transistors: Check transformer.
4. Meters are reading but no plating or cleaning action. Check you have anodes fitted to the rear bar and that they are making good contact: check that solutions are installed correctly: Check that the red and black sockets that the anode and cathode bars plug into are clean.
5. Solutions have evaporated. Providing that the solution levels have not fallen below 50mm deep, the addition of distilled water will reactivate most processes. Top up solutions on a daily basis.
6. Solutions are dirty. Filter plating solutions through a laboratory filter paper or coffee filter if these are not available. Discard and replace the electrolytic cleaner.

Disposal of Chemicals

Check with your Water Supply Company to find the level and type of chemicals you may dispose of.
Pay particular attention if your waste system discharges into pools, ponds or streams.
Electrolytic cleaner does not contain strong alkali or Cyanides. Dilute with 10 times the volume of water and flush away.
Gold plating solutions all contain Cyanides in some form, and must be treated to change this chemical into Cyanates. The addition of 100 mls of Sodium Hypochlorite per litre of gold plating solution, followed by stirring in a well ventilated place will treat normal solutions. Sodium Hypochlorite is available from laboratory supplies or swimming pool chemical suppliers.
Rhodium plating solutions are not suitable for neutralisation to remove toxicity, these solutions should be returned to authorised companies for treatment when sufficient quantity has been accumulated.

ALWAYS CHECK BEFORE DISCHARGING ANY CHEMICALS

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