

Bright Acid Copper Plating Instructions



Copper plating can be used for several operations. This soft metal can be applied in thick layers that can be sanded, soldered and polished to a high shine, making its use somewhat like a high build filler paint coat. It may also be used to 'electroform' articles in various ways, and to 'bronze' non-conductive items such as leaves and baby shoes.

Our acid based Copper Plating System is designed to apply heavy layers of copper, which can be sanded, soldered and/or burnished. It will only

plate directly onto copper, brass, bronze, Copy Chrome and nickel.

Making up the Copper Plating Solution

Tank Setup For 1.5 Gal Kit

For 3 Gal Kit, multiply by 2

For 4.5 Gal Kit, multiply by 3

For 15 Gal Kit, multiply by 10



READ MSDS AND WEAR ALL PROTECTIVE GEAR

Degreasing Tank

1. In one of your plastic tanks, add 1.5 gallons of distilled water.
2. Add 12oz of SP Degreaser Powder
Heat and mix well. Degreaser works best at hot temps

Plating Tank

1. In the other plastic tank, add 1 gal and 3 pints (176 fl oz or 5.2L) of distilled water
2. Install and start agitation pump
3. Add one bag of copper crystals (2.5 pounds)
4. Add 1 pint (16 oz, 473 mL) of battery acid
5. Add 1.5 oz of Copper Brightener A (1 bottle)
Measure out 0.3 oz of Copper Brightener Part B and add to tank. Store the remainder for adding to tank when required.
6. Mark liquid level with permanent marker
7. Remove pump and let solution sit overnight to age
8. Cut strip up anodes (see page 24)
9. Wrap bandages around anodes and secure with elastic band.
10. Install anodes in tank (see page 24)
11. Install Tank Bar (see page 9)
12. Install heater and pump. Heat to approx 110F
13. Plate a piece of scrap brass or copper about 15 sq. ins surface area for approx. 1 hr with 1 amp.
This will expel any impurities from the solution.

Do NOT attempt to plate steel, pot metal or aluminum without first applying a 'strike' coat of the appropriate metal. See the METALS CHART for more information

To apply a more even layer over rough surfaces, we have found it is best to remove the part from the tank and sand down with wet & dry paper, then return to the tank for more plate. This gives a more even plate than trying to apply all the copper at once. Buffing between layers will also help to produce a high quality finish.

Copper will plate quickly, and if left too long will grow nodules and trees resembling coral growths on the part. These are fairly hard to remove. Agitation and a lower current will reduce the amount of buffing required. You may remove the part from the tank frequently, with no adverse effects to the successive layers of plate.



Acid copper is commonly used to electroplate non-conductive surfaces. Plastics, baby shoes, leaves, flowers, corals, even insects (see left)



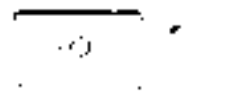


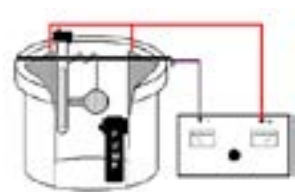


More detailed instructions for plating non-conductive parts can be found later in this manual, but the general steps are:

1. Make the item Non-Porous with a lacquer
2. Make the part conductive (conductive paint, or silvering system)
3. Tin the item with tinning solution (only if using conductive paint)
4. Plate with Acid Copper
5. Plate with bronze, brass, nickel, gold etc or antique with one of our antiquing solutions.

To ensure complete copper plate coverage, it is sometimes necessary to attach multiple copper hanging wires to the part.

Although the average plating time is 15-20 minutes, copper may be plated for several hours if a really heavy layer is required. For a finer, denser plate, increase the tank temperature using the aquarium heater, and reduce the amperage. If the copper plate looks dark and is rough, or has a layer that rubs off, you will need to reduce the amperage during plating. Ideally, the color of good copper plate is a 'salmon pink'

Copper Brightener Part B is consumed by the system. To maintain brightness, add small amounts (0.1 – 0.3 oz) of Copper Brightener Part B when required. Technical consumption is 1 quart of Part B per 2000 amp hours.

PROCEDURE	SETUP	OPERATING PARAMETERS	EQUIPMENT	SAFETY
1. SURFACE PREPARATION	Sand/bead blast or Nylon Abrasive wheel. Degrease BEFORE bead blasting to avoid pounding grease into surface If required, buff, polish, and THEN DEGREASE again. If surface has already been plated with Flash Copper, then simply spray rinse twice and begin plating.			
2. DEGREASING		140- 200F No agitation 5 mins immersion 12 oz. SP Degreaser 1.5 gal Distilled water	1 x Plastic tank 1 x tank lid 1 x heater 1 x 2lb SP Degreaser	
3. RINSE IN DISTILLED WATER SPRAY				
4. WATER BREAK TEST	 Oil/dirt film makes water bead up		 No oil/dirt film allows water to cover part	
5. CALCULATE TOTAL SURFACE AREA AND AMPERAGE REQUIRED (0.07 AMPS PER SQUARE INCH)				
6. TANK MAKEUP		<ul style="list-style-type: none"> • 70-90°F • Agitation (pump) • Copper Crystals 2.5lb • Battery Acid 16 fl oz • 176 fl oz DISTILLED WATER • 1.5 oz Cu Bright A • 0.3 oz Cu Bright B • 0.07 – 0.2 amps/sq in • 2-5 volts approx • pH = 1.2 -1.7 	<ul style="list-style-type: none"> • 1 x Glass Heater • 1 x Tank • 1 x Tank lid • 2 Copper Anodes • 2 Anode Bandages • 1 x filter/pump • Copper Crystals • Cu Brightener A&B • Distilled water 	Wear rubber gloves and goggles. Do not ingest.  
7. PLATING TIMES	Plating thickness is dependent on both amperage and time. Rapid build up can be achieved by increasing the amperage, but overdoing it will produce a dark brown plate, with gritty copper nodules. These are loosely bonded and will wipe off. There is a huge operating range here, and practice is essential. Time Plate Thickness 15 mins 0.00025 " - 0.0005 " 30 mins 0.0005 " - 0.001 " 60 mins+ 0.001 " - +			
8. ADD LOST WATER	After plating, top up the tank with DISTILLED water to the original waterline.			
9. BUFF & POLISH	Buff and polish to enhance the finish, using white buffing compound or Blue Begone Polish			
10. WAX	If copper is your finished product, apply a coat of Collinite Metal Wax, or VHT Clear Lacquer. Do not apply coating if you are going to apply further plates.			
11. FURTHER STEPS	<ol style="list-style-type: none"> 1. You may plate with Acid copper to build thickness 2. Plate with Nickel, then Chrome for a Triple Chrome Plate 3. Plate with Nickel and finally Gold. 4. Antiquing solutions for green or black or bronze patinas. 			

Copper Plating Troubleshooting

Problem	Cause	Remedy
No deposit	No current (or gassing from part)	Check all electrics
Pitted Plate and Orange Peel effect	Impurities in solution	Plate a dummy for 30 mins. If no improvement, filter solution through activated charcoal placed into a coffee filter, then replace the Brighteners (You will have to order new A & B brighteners)
Rough Plate	1. Amps too high 2. suspended particles in solution 3. pH too high or low	1. Reduce current 2. Filter solution through a coffee filter (No charcoal) 3. Adjust pH Check anode bags are not torn etc.
Dark deposits (esp. on low spots)	Zinc, lead etc. in solution	Plate a dummy for 30 minutes.
'Burnt' Plate	Too much current	Reduce current, check solution temperature and reduce if needed.
Cloudy deposits on the plate	1. Poor cleaning/rinsing 2. Organic Contamination 3. High temperature 4. Low agitation	1. Improve cleaning/rinsing 2. Filter solution through activated charcoal placed into a coffee filter, then replace the Brighteners (You will have to order new A&B brighteners) 3. Adjust temperature 4. Improve agitation
Dull plate	1. Too much amperage 2. Part not buffed enough 3. Brighteners exhausted	1. Reduce amperage 2. Buff Part prior to plating 3. Add Brightener Part B
Plate Peels or Blisters off	1. Too much amperage 2. Surface too hot when buffed 3. Poor surface prep 4. Plated onto steel	1. Reduce amperage 2. Reduce pressure on buffing wheel 3. Improve cleaning/rinsing 4. Prime with Flash Copper
Plate peels or blisters off when applied to nickel base	1. Nickel has oxidized 2. Insufficient cleaning 3. Current too high	1. Prior to plating swab nickel base with battery acid, then rinse. 2. Improve cleaning/rinsing 3. Reduce amperage