



**BANGALORE REFINERY**

## **PALLADIUM BATH PLATING SOLUTION (PBPS)**

### **GENERAL INFORMATION:-**

PBPS (Palladium Bath Plating Solution) is a traditional palladium plating electrolyte for bath plating. The chemical make-up of this ammonia based product deposits a consistent layer of 99.9% pure palladium to the metal substrate which it is applied. PBPS is primarily used for flash plating as the maximum thickness achievable is 0.2 micron. The palladium deposit can be used as a barrier to prevent copper migration which is common to metal substrates containing significant amounts of this element.

### **TECHNICAL DATA SHEET:-**

<b><u>Parameters</u></b>	<b><u>Values</u></b>
Metal Concentration	2g/ 1000 ml
Product's pH	Neutral to slight alkaline (7 - 7.8)
Solution form	Liquid
Solution form	Ready-to-use
Plating solution colour	Yellow/Green
Storage Time	2 years
Volume	1000 ml
Metal Purity (%)	99.9
Plating appearance	Shiny
Plating colour	White
Voltage [V]	3 volts – 4 volts
Working temperature [°C]	Ambient room temperature
Exposure time (sec)	Immediate (8 – 10) seconds
Anode	Plattonized Titanium
L*	84,2
a*	0,4
b*	4,1

### **PREPARATION:-**

PBPS is a ready-to-use galvanic bath at the concentration of 2 g/l of palladium. No preparation is required.

## **EQUIPMENT:-**

For Lesser Bath Volume:-

- Working vessel material: Pyrex glass / PVC / polypropylene
- Power supply: DC current rectifier with low residual AC (<5%).
- Heating element
- Anode type: Platinized titanium (1.5-2.5  $\mu\text{m}$ )

For larger bath volumes:-

- Magnetic driven filter pumps with 5-15  $\mu\text{m}$  cartridge
- Amp/min counter

## **PRE TREATMENT:-**

PBPS can be deposited directly onto silver, gold, copper, nickel and other alloys. An intermediate deposit or precious metal plating strike is necessary before depositing onto tin, lead, zinc, cadmium, aluminum and iron or alloys which contain any substantial amount of the elements listed.

## **POST TREATMENT:-**

The electrolyte should be removed from the surface as quick as possible. Wash off the bath residual in a recovery rinse (still rinse). Rinse the parts in circulating deionized water and dry.

## **WATER PURITY:-**

To prevent contamination of the bath both during its preparation and any subsequent replenishing operations, use demineralized water with a conductivity of less than 3  $\mu\text{S}/\text{cm}$  (containing no traces of organic compounds, Chlorine, Silicon, or Boron).

## **BATH MAINTENANCE:-**

For small volume PBPS bath (up to 5-6 liters) use the bath until exhaustion, without making any addition of the PRS replenisher units. For larger volumes, additions can be made using the replenisher stated below in the paragraph. For optimal operation of the galvanic bath, it is advisable not to deplete more than 20% of the initial palladium concentration; for example, with a bath operating at a concentration of 2 g / l the additions must be made after a maximum consumption of 0.4 g / l of Palladium. To carry out the additions it should be remembered that, under optimal operating conditions, a bath operating at 2 g / l normally deposits about 20 mg of palladium for each Ampere / minute. Since Palladium is a precious metal, and for the purpose of accurately assessing consumption, it is advisable to carry out periodic analytical checks. The replenisher units for the PBPS galvanic process are available in palladium packs of 10 g (PRS). The replenisher PRS is composed palladium salts and brighteners. So the customer dont need to buy brightners separatly. During the addition of palladium replenisher solution a good stirring of the solution is required. It is recomended that after maximum consumption of palladium bath, 10 ml of PRS should be added to the existing bath with proper stirring for renew of ready-to-use palladium bath.

## **ABOUT THE pH:-**

Optimal pH is 7.5. Normally the pH tends to decrease spontaneously due to the ammonia evaporation during time. In case add a solution of 50% ammonia to restore it. On the contrary, in case you are in the situation to decrease it add a solution of diluted 10% sulfuric acid.

## **SUPPLEMENTARY INFORMATION ABOUT PLATING PROCESS:-**

The items to be treated are prepared according to the usual process. In general it is recommended to start by degrease the pieces in an ultrasonic solution followed by rinsing and a subsequent alkaline electrolytic degreasing step at 5-6 volts for 1-2 minutes. Neutralization is done by immersion in a 5% sulfuric acid solution or similar solutions, followed by a rinse in demineralized water and the palladium plating step with moderate agitation of the pieces. Avoid the application of too much high voltages as they can cause localized burns of the surface close to the high current density areas which will be visible after successive plating treatments even. If the palladium plating treatment is applied as an intermediate layer on white gold items which are then rhodium plated, it is important to do both plating steps in rapid sequence. After the palladium plating treatment, the pieces are rinsed with demineralized water and neutralized before entering in the final rhodium plating solution. Never perform complete electrolytic degreasing treatment on the palladium plated pieces as it will cause blackening of the pieces due to the absorption of the gaseous hydrogen in the palladium layer and generated by the water reduction close to the cathode. If you have accidentally done this, an anodic treatment (inverted polarity) or heating of the pieces for a few minutes at 80°C should restore the original features of the plating.

## **SAFETY INFORMATION:-**

Although PBPS can be considered a product of low-toxicity, irritation to the skin, eyes and mucous membrane cannot be excluded. Caution should be exercised when using the product, avoiding contact with the eyes and skin. Use gloves and safety goggles.

## **DISCLAIMER:-**

All recommendations and suggestions in this bulletin concerning the use of our products are based upon tests and data believed to be reliable. Since the actual use by others is beyond our control, no guarantee expressed or implied, is made by BRPL, as to the effects of such use or results to be obtained, nor is any information to be construed as a recommendation to infringe any patent.