


GENERAL INFORMATION

PD3-ECO is the most advanced formulation of palladium plating. This new generation palladium is totally absent of free ammonia granting extremely simple production management and an eco-friendly production approach. In addition to reducing environmental impact, PD3-ECO makes the operator's work healthier and easier as frequent pH management or regular additions of concentrated ammonia is not required. Moreover, since the pH of the bath is near neutral, hydrogenation of the deposit is limited compared to the traditional ammonia baths; this provides a white deposit almost like that of rhodium and is less porous than the traditional palladium baths

Product form

Metal concentration	3 g/l (Pd)
Product's pH	Neutral/Alkaline
Solution form	Liquid
Solution form	Ready-to-use
Plating solution color	Pale yellow
Storage time	2 years
Volume	1 liter

Deposit data

Purity (%)	99.9
Solution appearance	Shiny
Density [g/cm ³]	12.0
Plating solution color	White
Thickness range [μm]	0,02 - 0.20



Operating data	RANGE	OPTIMAL
pH	6.0-7.5	6.5
Voltage [V]	1.0-1.8	1.5
Current density [A/dm ²]	0.5-1.5	1.0
Working temperature [°C]	35-50	40
Exposure time (sec)	60 - 480	240.0
Cathode efficiency [mg/Amin]	circa 30	
Anode type	Platonized titanium	
Agitation	Moderate	

Metal concentration	METAL	RANGE (g/l)	OPTIMAL (g/l)
	Palladium	2-5	3.0

Color coordinates

L*	84.8
a*	0.4
b*	4.3
c*	4.3

**PREPARATION**

PD3-ECO is a ready-to-use galvanic bath at the concentration of 3 g/l of palladium. No preparation is required.

EQUIPMENT

- 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 µm)
- For larger bath volumes:
- Magnetic driven filter pumps with 5-15 µm cartridge
 - Amp/min counter

PRE TREATMENT

PD3-ECO 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 µS/cm (containing no traces of organic compounds, Chlorine, Silicon, or Boron).

BATH MAINTENANCE

For small volume baths (up to 5-6 liters) use the bath until exhaustion, without adding any adding of replenishing unit PDXWR. For bigger baths, additions shall be performed using the appropriate replenishing unit as reported here below. For optimum performance of the bath, it is best to work with a bath concentration that is within 20% less than the initial concentration; for example, with a bath at 3 g/l nominal value, additions must be done after a maximum consumption of 2,4 g/l of Palladium. In order to perform the additions, always consider that a 3 g/l bath deposits on average 30 mg of Palladium per Ampere/minute. As Palladium is a precious metal, and in order to control consumption, periodic analytic controls are advised. The replenisher units necessary in the PD3-ECO are those contained in the PDXWR product. PDXWR is sold in one liter bottle which contains 5 replenisher units of 200 ml each.

PALLADIUM CONSUMPTION: with all those premises, in order to run a good maintenance of the electrolytic system, we can consider that **EVERY 3000 Amiutes 100 g of fine Pd are consumed** and must be restored as PD100R Pd or PD100RW salts. Following to this operation add then 1 unit replenisher of PDXWR: so that means that **1 unit replenisher of PDXWR (200 ml) has to be added every 100 g of Pd added in the electrolytic system**. Nevertheless we repeat that a frequent analytical control of the real Pd concentration is suggested to perform the maintenance operation in a good way.

About the DENSITY: keep constant the density at optimum values between 11,0-15,0 Bé°. If the density is too much lower than those range values restore it by adding the related conducting salts. In this sense remind that **to higher of 1 Bé** the density of the PD3-ECO it will be necessary to **add 10-15 g/l of PDXWSC** (conducting salts) + **5-7.5 g/l of PDXWSS** (stabilizers salts).

About the BRIGHTNESS: if by chance the Pd deposit loses brightness (and it might be the case after carbon active filtration also) the same will be restored by the separate addition of its brightener compounds. In doing so **add stepwise 4 ml/l of PDXWBR1 + 2 ml/l of PDXWBR2** and **in case repeat this operation for not more than 2 consecutive times** for a total of 8 ml/l of PDXWBR1 and 4 ml/l of PDXWBR2.


SUPPLEMENTARY INFORMATION

The items to be treated are prepared according to the usual process. In general it is recommended to start by decrease 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 with the Pd solution 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 importante 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 PD3-ECO 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. For further information please refer to the relative safety sheet.

DISCLAIMER

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