

## PALLADIUM FLASH PLATING SOLUTION 2g/l

Last revision

31/03/2010

Pag. 1/2

Colour **White**

[ L: 83,8 a: 0,4 b: 4,3 c: 4,3 ]

### Product description

PD2 is a ready-to-use palladium plating bath purposely designed for flash plating. PD2 is characterised by the considerable compactness and resistance of the galvanic layer which makes it particularly suitable as a barrier against the diffusion of gold deposits on copper and its alloys. These characteristics of compactness and resistance also make PD2 particularly suitable for use as an intermediate layer between white gold and rhodium, considerably reducing the possibility of scratches and abrasion of the rhodium-plated layer affecting the alloy below.

This condition is very important for preventing release onto the skin of part of a white gold alloy containing nickel. The main characteristics of PD2 are:

- **Low concentration of palladium**
- **Neutral process, easy to use**
- **Non-toxic, non-corrosive**
- **Stability**

### Recommended applications

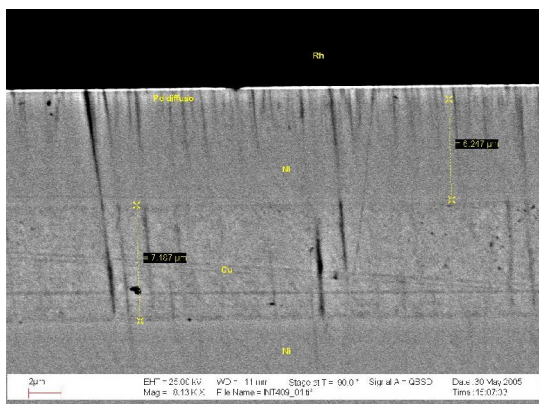
PD2 is purposely designed for flash plating for use as a barrier against the diffusion of gold deposits on copper and its alloys. It is also particularly suitable as an intermediate layer between white gold and rhodium plating.

### Deposit data

Purity [%]	99.9
Density [g/cm <sup>3</sup> ]	12
Thickness [µm]	0.02-0.20
Appearance	Shiny

### Operating data

Initial solution concentration [Palladium, g/l]	2	2
Cathode efficiency [mg/Amin"]	circa 20	
Time of exposure [s]	45-120	90
Operating temperature [°C]	20-35	30
Current density [A/dm <sup>2</sup> ]	0.3-1.0	0.5
Voltage [V]	1.5-2.5	2
Anodes	---	Pt or Ti/Pt
Agitation	Null-moderate	Moderate



Rhodium and palladium plated sample

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### Additional informations

#### Packaging

The product comes in a high-density polyethylene bottle.

**IMPORTANT: Once the package is opened the solution should be transferred to the container in which it is to be used; under no circumstances should the solution be stored inside its original packaging.**

#### Equipment

It is more practical to use glass containers for quantities up to 5 litres, whereas for greater quantities it is best to install PTFE or polypropylene plants equipped with:

- a current rectifier with an ammeter and voltmeter, with low residual AC <5%.
- amp/min counter.
- platinum-coated titanium anodes, coated with 2.5  $\mu$  of platinum.
- magnetic drive filter pumps with 5-15  $\mu$  cartridge.

**N.B.** Before use boiling and washing of the cartridges with demineralized water is recommended to prevent organic contamination.

#### General notes on the palladium plating process

The items to be treated are prepared according to the usual method. In general you are recommended to start by washing in an ultrasound bath, followed by rinsing and subsequent alkaline electrolytic degreasing (e.g. Legor SGR1) at 5-6 Volts for 1-2 minutes. Neutralise by immersion in a 5% sulphuric acid solution or similar (e.g. Legor NEUT1), rinse in demineralised water and immerse the pieces in the palladium plating bath at 30°C for 2 minutes, at an approximate voltage of 1.5 - 2 Volts, agitating moderately. Although this is a flash treatment, the high plating time is due to the reduced electrodeposition speed. Avoid the application of high voltages as they can cause burning on the pieces, which is visible even after successive plating treatments. If the palladium plating treatment is applied as an intermediate layer on white gold items which are then rhodium-plated, it is important that the palladium and rhodium plating are performed in rapid succession. After the palladium plating treatment, the pieces are rinsed with demineralised water and neutralised in a 5% sulphuric acid solution or using the Legor NEUT1 solution. After rinsing with demineralised water, the pieces must be immediately rhodium plated following the normal instructions. Never perform electrolytic degreasing treatment on the palladium plating as it will cause blackening of the piece due to absorption of the hydrogen in the palladium. If you have accidentally done this, anodic degreasing treatment (inverted polarity) or heating of the pieces for a few minutes at 80°C should restore the original characteristics of the plating.

#### Temperature

PD2 gives excellent performance for standard flash treatments at 25-30°C temperature. Should it be necessary to speed up the deposition process, the temperature can be increased up to 35°C.

#### Analytical checks

The process in question is particularly easy to perform and does not require frequent analytical checks. However, our Technical Assistance Service is at hand to offer suggestions, advice and periodic analytical checks on all bath components.

#### Galvanic Bath Maintenance

For small volume baths (up to 5-6 litres) use the bath until exhaustion, without adding any adding of replenishing unit PD20R or PD100R. For bigger baths, additions shall be performed using the appropriate replenishing unit as reported in the table 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 2 g/l nominal value, additions must be done after a maximum consumption of 0,4 g/l of Palladium. In order to perform the additions, always consider that a 2 g/l bath deposits on average 20 mg of Palladium per Ampere/minute. As Palladium is a precious metal, and in order to control consumption, periodic analytic controls are advised.

#### Replenishing compound usage

The replenisher units necessary in the PD2 process, are available in 20 g form ( PD20R ) and 100 g form ( PD100R ) of Palladium. Both replenisher units are composed by two separated compounds "A" and "B" . PD20RA is containing the palladium salts and the PD20RB in containing the brighteners. The same concept is applied for PD100R. it's important to know that the palladium present in the unit "A" is a salt form and 2 grams of powder "A" contain 1 g of palladium metal. As the PD2 process has a cathodic efficiency of 20 mg per Ampere/minute, the PD2 bath loses approximately 20 g palladium metal every 1000 ampere/minute.so, for that reason for adding 20 g of palladium metal must be added 40 g of PD20RA or PD100RA and 20 ml of PD20RB or PD100RB.It is recommended to stir the solution vigorously while adding the PD20RA or PD100RA

#### Safety Information

Although PD2 can be considered a low-toxicity product, 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.

PD2 bath plating solutions	Code
PD2 ready-to-use palladium plating bath (1lt bottle with containing 2 g of palladium)	PD2
PD2 ready-to-use palladium plating bath (5 lt can containing 10 g of palladium)	PD10
Replenishing solution for PD2 palladium baths (palladium salts in powder containing 100 g of palladium)	PD100R
Replenishing solution for PD2 palladium baths (palladium salts in powder containing 20 g of palladium)	PD20R
PD2 conductor salts	PD2SC
Brightening solution 1 for PD2 palladium plating bath	PD-B1
Brightening solution 2 for PD2 palladium plating bath	PD-B2
Surfactant solution for PD palladium plating bath	PD-WA