

PD8W

Technical chart

Last revision

21/12/2012

NICKEL FREE READY TO USE PALLADIUM PLATING SOLUTION 8g/l

Pag. 1/2

Colour **White**

[L: 86,2 a: 0,6 b: 3,8 c: 3,9 Yl: 8,4]

Product description

PD8W is a ready-to-use palladium plating bath purposely designed for both flash plating and thick deposits. PD8W is suitable for the treatment of those details that requires the deposition of pure palladium and it is characterised by the high resistance and robustness of the galvanic deposit which makes it particularly suitable either as a finish in itself, or as a barrier layer plating process especially between copper or its alloy and gold. Besides, thanks to its characteristics, this bath is particularly suitable for nickel-free finishing systems.

- **Extremely white, bright, levelled deposits**
- **God for both flash plating and thick deposits**
- **High plating speed**
- **Easy to control**
- **Very low toxicity**
- **Good corrosion tolerance**
- **Optimum performance as barrier layer especially between copper and gold**
- **Good tolerance to contaminant metals**

Recommended applications

PD8W is purposely designed for both flash plating and for thick deposits for use either as a finish in itself or as a barrier layer plating process. Thanks to its characteristics, it is particularly suitable for nickel-free finishing systems.

Deposit data

Purity [%]	99
Density [g/cm ³]	12
Thickness [µm]	0.3-5
Appearance	Shiny

Operating data

	Range	Optimum
Initial solution concentration [Palladium, g/l]	8	8
Cathode efficiency [mg/Amin"]	32-33	
Time of exposure [s]	45-120	90
Operating temperature [°C]	30-65	55
pH	7.0 - 9.5	8
Current density [A/dm ²]	0.25-1.5	1
Voltage [V]	1.5-2.5	2
Anodes	Pt or Ti/Pt	Pt or Ti/Pt
Agitation	Null-moderate	Null-moderate
Anode/Catode surface ratio	2-4/1	

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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 µ of platinum.
- magnetic drive filter pumps with 5-15 µ 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 ultrasonic 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 55°C for 2 minutes, at an approximate voltage of 1.5 - 2 Volts, under moderate stirring. 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

PD8W gives best performance if the temperature is between 30 and 60°C. The optimum value is 55°C. Keep in mind that by changing the temperature, speed of deposition does not change but what is changing is the appearance of the deposit itself: the lower is the temperature and the deposit will appear less bright while higher temperatures give brighter mirror-like deposits but with higher internal tensions, especially for thickness higher than 2 microns. Moreover keep in mind that by operating at values of temperature higher than 40°C, the electrolyte suffers degradation faster.

pH

It is important to know that pH tends to fall due to ammonia evolution with the consequence of brightener precipitation. **The pH value should be maintained close to the optimum value of 7.5 regularly.** Add either 20% potassium hydroxide or 50% ammonia to raise, otherwise 20% v/v sulphuric acid to lower the pH. Best to use a pH meter and to make measurements at the bath temperature, rather than cooling samples to room temperature.

Pre- and post-treatment

PD8W does not need any particular pre-treatment cycle, anyway, it is recommended to make a good washing of the pieces in order to preserve the bath from any pollutant. Since PD8W is able to make extremely white, bright, levelled deposits with a good corrosion resistance, no post-treatments are normally required, even thanks to the very high cathode efficiency. In any case, for thickness of deposit higher than 2 microns, a post-treatment in demineralized hot water (80 - 90°C) or even in hot air (120 - 140°C) should further improve the deposit features.

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 litres) use the bath until exhaustion, without adding any adding of replenishing unit. 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. In order to perform the additions, always consider that a 8 g/l bath deposits on average 32-33 mg of Palladium per Ampere/minute. As Palladium is a precious metal, and in order to control consumption, periodic analytic controls are advised. In order to achieve optimum performances, WORK IN CONTINUOUS FILTRATION.

Replenishing compound usage

Normally for each 3000 Ampere/minute 100 g of palladium are consumed. Restore by adding one unit replenisher of PD100RW and by adding 1 kit of PD-BW (500 ml PD-BW A plus 500 ml PD-BW B) kit replenisher for PD8W.

Safety Information

Although PD8W 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.

PD8W bath plating solutions	Code
PD8W ready-to-use palladium plating bath (1 liter bottle with containing 5 g of palladium)	PD8W
Replenishing for PD8W (palladium salts containing 100 g of palladium)	PD100RW
Replenisher brightener solution for PD8W (kit formed by 500 ml of PD-BW A and 500 ml of PD-BW B)	PD-BW