



PD4-FE

PALLADIUM IRON SOLUTION FOR BATH PLATING 4 G/L READY-TO-USE BRIGHT WHITE COLO

GENERAL INFORMATION

PD4-FE is a ready-to-use palladium iron alloy electrolyte. By using iron as an alternative to the common palladium alloys: Nickel and cobalt, the deposit remains 100% hypoallergenic. The solution is ammonia free making it easy to operate over time and aside its decorative use, it also combines a protective layer against corrosion and copper migration as it is an air-tight layer free from internal tension within the micro-structure at every thickness.

Product form

Metal concentration	4 g/l (Pd)
Product's pH	Acidic/Neutral
Solution form	Ready-to-use
Plating solution color	Yellow/Green
Storage time	2 years
Volume	1 liter

Deposit data

Purity (%)	90.0
Solution appearance	Shiny
Hardness [HV 0.01]	450-500
Density [g/cm ³]	12.0
Plating solution color	White
Thickness range [μm]	0,2 - 5



Operating data	RANGE	OPTIMAL
pH	6.5-7.2	6.8
Voltage [V]	1-2.5	1.7
Current density [A/dm ²]	0.75-1	1.0
Working temperature [°C]	30-55	50
Exposure time (sec)	40 - 1200	0.0
Cathode efficiency [mg/Amin]	29	29.0
Anode-cathode ratio	2:1-4:1	2:1
Anode type	Platonized titanium	
Agitation	Moderate	

Metal concentration	METAL	RANGE (g/l)	OPTIMAL (g/l)
	Palladium	2-5	4.0

Color coordinates

L*	83.8
a*	0.4
b*	4.3
c*	4.3

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PREPARATION

PD4-FE is a ready-to-use galvanic bath at the concentration of 4 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

PD4-FE 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

Additions to the PD4-FE system should be done by using the pre-calibrated replenisher reported in the related products section. For optimum bath performance, it is best to work at a metal concentration no less than 25% of the the initial concentration; for example, with a bath at 4 g/l nominal value, additions must be made after a maximum of 1 g/l of palladium is consumed. In order to perform the additions, consider that a 4 g/l bath deposits on average 25 mg of Palladium per Ampere/minute.

As Palladium is a precious metal, it is advisable to perform periodic analytic controls via ICP or AAS in order to control consumption. Keep in mind that the solution works with an optimum iron concentration of 0.6 g/l within a range of 0.5 - 0.7 g/l.

SUPPLEMENTARY INFORMATION

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 importanto 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.

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SAFETY INFORMATION

Although PD4-FE 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

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 Legor Group, its subsidiaries or distributors, 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.