LEGOR®

JEWELRY PLATING

TECHNICAL SHEET

PTPURE2

PLATINUM READY TO USE PLATING BATH 2G/L Pt

DESCRIPTION

PTPURE2 is an electrolytic solution of Platinum for **FLASH** applications. Its innovative formula makes it more performing than PT4 as it is characterized of a good cathodic efficiency at 2 g/l of Pt already. Last, but not least, working at 2 g/l instead of 4 the plating solution is now cheaper. This system deposits a shiny layer of white - greyish made of 99.9% of pure platinum. The chemistry of PTPURE2 is extremely flexible allowing for a wide range of platinum metal concentrations to be used ranging from 2 – 20 grams per liter. The higher is the used metal concentration, the higher is the obtainable thickness until reaching a maximum deposit of 20 microns. These features make this platinum electrolyte ideal for technical electroplating applications.

- Depositions with no cracking
- Wide and flexible operating range
- Suitable for both rack and rotobarrel applications

DEPOSIT DATA	
Thickness (µm)	Until 0.2 (at 2 g/l)
Density (g/cm^3)	21.4
Purity (%)	99.9%
Hardness (HV)	500
Aspect	Shiny
Color	Pure Platinum (Bianco)

PRODUCT FORM	
Form	Ready to use solution
Metal concentration	2 g/l (Pt)
Color of the solution	Colorless – pale yellow
Chemical status	Acidic
Storage time	2 years
Volume	1 liter bottle

PRODUCT USAGE	RANGE	OPTIMAL
Voltage (V)	1.5 – 2.5	1.8
Current density (A/dm2)	0.5 - 5	2
Working temperature (°C)	25 - 40	35
Exposure time (sec)	About 0.06 µm/min at 2 A/dm^2	
Cathode efficiency (mg/Amin)	4 – 6	5.5 at 1.5 A/dm^2 6.5 at 2.0 A/dm^2
pH	< 1	
Free acidity		60 ml/l of sulfuric acid
Solution density	≥ 9°Bé	
Anode/cathode ratio	1:1-4:1	2:1
Anode type	Ti/Pt with minimum 1,5 µm of Pt layer	
Agitation	Suggested the agitation for the solution while the cathodic bar movement is not necessary while plating	

METAL CONCENTRATION		
METAL	**RANGE (g/l)**	**OPTIMAL (g/l)**
Platinum (Pt)	2 – 20	2 - 4

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COLOR COORDINATES	
L	86.6
a	0.7
b	4.3
c	4.3

Note: Color coordinates here reported have been measured on a white underlayer and they are to be intended as PURELY INDICATIVE being strongly dependent on underlayer color, on thickness of the deposit and on specific design (shape) of the surface.

LIST OF THE CORRELATED PRODUCTS

PRODUCTS NECESSERY FOR INSTALLATION	
PTPURE2.1L*	PTPURE, platinum ready to use plating bath 2 g/l pure platinum color – 1L
PTPURE2F.250ML*	PTPURE, platinum concentrate (make-up) plating bath 2g/250ml pure platinum color – 250 ml
3030005.2500ML*	Sulfuric acid technical grade 96 – 98%, d = 1.84 g/ml
PTPURE5R.250ML*	Replenisher 5 g/250ml for PTPURE
PTSC.1KG	Conducting salts per PTPURE – 1kg
PTPURE-BR.1L	Brightener for PTPURE – 1L

SOLUTION PREPARATION

PTPURE2 is ready to use and not further dilution are required prior to start to work

PRE-TREATMENTS

PTPURE2 can be deposited directly on gold and palladium – nickel. For all the other metal underneath bases it is absolutely necessary an intermediate deposit or precious metal plating strike. For all those base- - metals that tends to be passivated during time it will be necessary to proceed, before platinum plating, with a suitable activation cycle.

As pre-treatment cycle it is strongly recommended to run a preliminary degreasing through a cycle of ultrasonic degreasing solution followed by a wash step into running water. Then proceed with electrolytic degreasing step by using **SGR1** alkaline solution.
Once finished rinse the items with D.I. water and then proceed in activate and neutralize the surface of the same by dipping the items in **NEUT1** slightly acidic solution for 3 - 4 times subsequently at room temperature, in order to be sure that no any alkaline residues coming from the degreasing previous steps are dragged into the platinum plating solution together with the same items to be treated.
This will prevent any possible risk of cross-contamination for the PTPURE2 plating solution and will make its life longer.
After neutralization wash one more time with running D.I. water and then go inside to the PTPURE2 plating solution tank.

POST-TREATMENTS

Proceed to remove any electrolyte traces from the surface as fast as possible. Wash off the electrolyte residues through a recovery (static rinse) followed by a wash in running D.I. water. Then proceed to dry the just treated items.

Before the last drying step it might be useful to run an ultimate recovery step in hot static D.I. water. This will confer more shine and brightness to the pure platinum deposit.

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BATH MAINTENANCE

Small – sized platinum plating solution (until 5 liters) can be used until exhaustion for the Pt content. Vice versa, for larger installations the restoring operations can be done by the addition of its proper replenisher solution **PTPURE5R** containing 5 g of Pt in 250 ml.

For optimum plating solution performance it is advisable to maintain its platinum concentration within 80% of the initial. It means, for example, that for a platinum solution working at 2 g/l the additions of replenisher must to be done no later than a consumption of 0.4 g/l in Pt. To do the additions of **PTPURE5R** replenisher keep in mind that under standard working conditions a bath working at 2 g/l deposits about 5 mg of Pt per each Ampereminute.
For this reason, as general guideline, an entire replenisher unit of 250 ml containing 5 g of Pt will be added every 800 Amins or, alternatively, add 1 gram of fine Pt (equal to 50 ml of replenisher **PTPURE5R** every 160 Amins)..

Attention! These values higher reported, although reliable, are purely indicative. They could be deviate from guideline depending on plant features, on specific articles to be treated, on the working methodology adopted.
For these reasons, it is advisable to do frequent chemical analysis of the ready to use plating solution and to dose replenishers and additives after analysis reported by our lab and technical service only.

REQUIRED EQUIPMENT AND SUPPLIES

ANODES

It is strongly suggested the use of Titanium Platinized anodes with a Platinum coverage thickness not lower than 1.5 µm.

MATERIALS FOR THE WORKING TANK

Pyrex glass (for small volume amount solutions in beaker scale) or PP/ PVC/ HDPE for larger volume tanks supplied together with a good quality exhaust fume/suction system (generation of mists diffused by gaseous hydrogen development also can be irritant if inhaled or with allergenic effects).

MOVEMENT AND FILTRATION

Solution needs to be under movement and stirred by a suitable magnetic driven filter pump. When in movement, the solution needs also to be filtered by using 5 microns (max 10 microns) PP wrapped wire filter cartridges which stayed previously immersed in deionized water heated at 60°C for a couple of hours and then washed with abundant deionized cold water before their usage.
Filter pump must have a flow rate 5 times/hour more than solution volume to have a proper solution filtration and movement during the electrolytic process.

If you wish to give movement to the objects to be covered with PTPURE2 even, they should be moved through a moving cathodic bar while plating. The cathodic bar movement needs to be done with a rate of 2 – 8 cm/s.

The movement of the solution let to obtain homogenous and bright finishes as this combination removes in the most efficient possible way the gaseous hydrogen bubbles developed closer to the items surfaces during plating time.

RECTIFIER

Use a current DC rectifier having an alternate current residue –ripple-less than 5% and having an output amperage sufficient to obtain a proper electroplating process. The rectifier should be equipped with:

- Ammeter
- Voltmeter
- Ampere/minutes counter

HEATING SYSTEM

The admitted materials for heaters are: Pyrex, quartz or PTFE.

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WATER PURITY

To prevent any bath contamination during the ready to use solution preparation or during any other subsequent maintenance operation, it is advisable to use deionized water with a conductivity less than 3 µS/cm (and free from any traces of organic compounds, silicon, boron).

SUPPLEMENTARY INFORMATION

PTPURE2 is a ready-to-use plating solution working at 2 g/l in Pt. for EXCLUSIVELY FLASH APPLICATIONS. Anyway it is possible to increase its Pt concentration by the addition of Pt complex solution PT25R (25 g Pt/l) to obtain a micron Platinum process. The best choice for the Pt concentration is strictly dependent on the desirable thickness to achieve. In the following Table there is a guideline for the Pt concentrations necessary to achieve a certain thicknesses range.

Pt CONCENTRATION (g/l)	SPESSORE MASSIMO OTTENIBILE (µm)
2	0,25
5	5
10	20
20	> 20

NOTE: The values listed above are to be intended as PURELY INDICATIVE, being finally strongly dependent on the type of starting substrate, the plating plant - system used as well as the type of surface (design) to be treated. Our Technical Assistance Service is available to suggest the choice of the most suitable concentration for the specific type of application to be done. To increase the throwing power of the plating solution, **PT4SC** conducting salts are available which, if necessary, can be added in the amount of 10 g/l once at a time until the desired conditions are obtained

SAFETY INFORMATION

Classification and designation are noted in the Material Safety Data Sheets for the product according to the European legislation. The safety instructions and the instructions for the environmental protection must be followed in order to avoid hazards for people and environment. Please consider the explicit details in our Material Safety Data Sheets.

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 of 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.

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