LEGOR FASHION PLATING

TECHNICAL SHEET

PTPURE

ELECTROLYTIC PROCESS FOR PURE PLATINUM DEPOSITION

DESCRIPTION

PTPURE is an electrolytic system which deposits a bright pure platinum (≥ 99.97%) layer. The chemistry of this electrolytic solution is extremely flexible, allowing for a wide range of platinum metal concentrations to be used, ranging from 2 to 20 grams per liter. The higher the metal concentration used, the higher the obtainable thickness until reaching a maximum deposit of 20 micron. These features make this platinum electrolyte ideal for technical electroplating applications.

- Platinum plating solution
- Flexible Platinum concnetration
- Achievable thickness of 0.2 – 20.0 micron
- Also designed for technical plating operations
- For both rack and roto-barrel applications

DEPOSIT DATA	
Thickness (um)	0 – 0.2 (at 2 g/l Pt)
Appearance	Bright
Color	Pure Platinum (white – light grey)

PRODUCT FORM	
Form	Ready – to – use 2 g/l for Pt plating solution or as concentrated Make-up Pt solution 2 g/250 ml which allows for 1 liter ready to use plating solution preparation with the addition of sulfuric acid.
Material color	Transparent up to pale yellow solution for the ready – to – use solution or yellow solution for the make – up.
Storage time	6 months since production date

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)	Around 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 at least 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 (for decorative)

LEGOR GROUP S.P.A. - Via del Lavoro, 1 - 36050 Bressanvido (VI) - Italy - Tel. +39 0444 467911 - info@legor.com - www.legorgroup.com

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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 PRODUCTS FOR PLATCORE PROCESS

PRODUCTS NECESSERY FOR INSTALLATION	
PTPURE2F.250ML*	Platinum concentrate (make-up) plating bath 2g/250ml pure platinum color – 250 ml
Sulfuric acid 96 – 98%	Sulfuric acid technical grade 96 – 98%, d = 1.84 g/ml
Alternatively:	
PTPURE2.1L*	Platinum ready to use plating bath 2 g/l pure platinum color – 1L

*Substances which are subjected to the international regulations concerning transportation of dangerous goods

PRODUCTS FOR BATH MAINTAINING AND RECOVERY	
PTPURE5R.250ML*	Replenisher for PTPURE 5g Pt/250 ml – 250 ml
PTPURE-BR.1L	Brightener additive for PTPURE – 1L
PTSC.1KG	Conducting salts for plating solutions, 1 kg

*Substances which are subjected to the international regulations concerning transportation of dangerous goods

SOLUTION PREPARATION

Before starting **PTPURE** solution preparation, make sure the working tank is perfectly cleaned. If not, the working tank should be cleaned with solution containing 2% of trisodium phosphate and 2% of KOH. The solution should be kept at 50 °C for two hours. Then, drain the tank and rinse with abundant deionized water.
Condition it again, at the very end, with a solution 2- 3% in sulfuric acid and in movement granted by the magnetic driven pump for about 1 day.

At this point it will be finally possible to set the ready to use plating solution by following step-by-step this procedure:

1. Fill at the beginning with deionized (D.I.) water the working tank for about **half volume with respect to the final volume to be set** (i.e.: add 5 liters of DI water for every 10 liters of ready – to -use final Pt solution to prepare).

2. Add then in the working tank the required make-up concentrated solution **PTPURE2F.250ML** in a number of 250 ml bottles equal to the final liters to be set (i.e.: add 10 bottles of PTPURE2F.250ML per 10 liters of final plating solution to be set).

3. Slowly (in order to avoid any overheating phenomena) add then the necessary amount of sulfuric acid and equal to 60 ml per every final liter of plating solution to prepare.

4. Once the required amount of sulfuric acid has been completely added in the forming solution add the remaining portion of D.I. water to raise the plating solution to its final volume.

5. Heat it (IF NECESSARY) to the optimum working temperature and finally start to work.

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*Alternatively it is possible to buy directly the ready for use plating solution **PTPURE2.1L**. In this last case it will be sufficient to put directly this solution into the working tank, heat it eventually to its optimum working temperature and start to plate.*

BATH MAINTENANCE

For the maintenance of the working solution over time, the following additions could be considered as a guideline after every 800 Amin:

- 1 complete replenisher charge **PTPURE5R.250ML** (250 ml bottle, equal to 5 g of Pt). This addition will also automatically restore all the other components of the solution that normally are consumed by drag – out.

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. In order to do replenisher additions it has to be known that this plating solution deposits about 6 mg of Pt per ampereminute at optimum operative conditions and when working with a Pt concentration of 2 g/l.

Finally the brightener solution **PTPURE-BR.1L** can be used as "Service Tool" as consequence - for example - of excessive *Darg – out* phenomena or treatment with active carbon and its subsequent filtration. In case it is necessary its usage, add 5 ml per every liter of plating solution at a time until getting starting brightness condition. Check the deposition quality after every single addition. In any case we would discourage to do more than four subsequent additions in order to not oversaturate of too much organic the plating solution.

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.

It will not be necessary to use a moving cathodic bar while plating. If the movement is in any case present it would be in the range with a rate of 2 – 8 cm/s.
The movement of the solution let to obtain homogenous and bright finishes as it removes in the most efficient possible way the gaseous hydrogen bubbles developed closer to the items surfaces during plating time.

RECTIFIER

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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:

- Ampmeter
- Voltmeter
- Ampere/minutes counter

HEATING SYSTEM

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

SUPPLEMENTARY INFORMATION

PTPURE is a plating process which ready – to – use solution, when working at low – medium concentration in Pt (2- 4 g/l), is EXCLUSIVELY FOR FLASH APPLICATIONS. Anyway it will be possible to increase its Pt concentration through the addition of the proper Pt complex solution PT25R (25 g/l Pt) 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, **PTSC** 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 each process product component (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

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