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# AUROMEX<sup>®</sup>

## TECHNICAL INSTRUCTIONS

### PALLMEX PS1000 PURE PALLADIUM ELECTROPLATING PROCESS

#### INTRODUCTION

**AUROMEX PALLMEX PS1000** is a mildly alkaline bright high speed pure palladium electroplating system based on a novel technology, producing a low stress, high ductility and extreme white and bright finish for electronic applications. **PALLMEX PS1000** is particularly suitable for use as substitutes or partial substitutes for several of the other precious metals, most notably gold, specifically designed for the plating of connectors, contacts and other components that are usually processed using high speed or selective techniques.

#### PROCESS CHARACTERISTICS

- \* Substitute for gold
- \* High hardness
- \* Low internal stress
- \* High ductility ( 6-8% elongation )
- \* Extreme white and bright finish
- \* Extremely economic
- \* Excellent deposit distribution
- \* No objectional odour during operation
- \* No free ammonia
- \* Non toxic electrolyte
- \* Ease of control

#### DEPOSIT CHARACTERISTICS

Appearance : Grey- white, bright ( follow substrate )  
Purity : 99.5% up Pd  
Density : 12.0 g / cc  
Hardness : 350-400 Hv20g  
Ductility : Substrate normally may be elongated by  
6-8% before cracking is seen at 400 X  
magnification in deposits which are 1 micron thick

**P-1**

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**AUROMEX<sup>®</sup>**

CHEMICALS CORPORATION

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## **EQUIPMENT REQUIRED**

Tanks	Polypropylene or PVC glass fibre reinforced tanks are suitable.
Rectifier	A standard D C power supply should be used with an ampere output capacity sufficient to meet the requirements of the plating operation. The power supply should be equipped with a Voltmeter, ammeter and stepless control for accurate regulation of the current.
Filtration	The solution should be filtered continuously through polypropylene or Cotton cartridges to maintain clarity.
Agitation	Moderate to vigorous agitation is necessary to maintain uniform metal distribution. Jet stream and mechanical agitation at 7 – 14 m/min may be used.
Anodes	Insoluble anodes should be used, platinised titanium anodes with an Area sufficient to provide a maximum current density of $0.25 \text{ A/dm}^2$ are recommended.

## **MAKE UP INSTRUCTION**

### **Palladium Complex :**

For the preparation and maintenance of the solution, palladium is added in the form of **PALLMEX PS1000 'P'** Complex palladium concentrate (100g/l pd metal).

Preparation of the solution :

Pallmex PS1000 make up is supplied as a ready for use electrolyte, it contains all the necessary agents to make up the bath, but does not contain Palladium.

Material required : For 10 litres of electrolyte

Pallmex PS1000 'P' Complex ( 100 % pd metal )	1 litres
Pallmex PS1000 Make Up Electrolytes	9 litres
Pallmex PS1000 Brightener	as required
Pallmex PS1000 Wetting Agent	as required
Pallmex PS1000 Acid Adjustment Sol'n	as required
Ammonium Hydroxide	as required

## OPERATING CONDITIONS

	<u>Unit</u>	<u>Optimum</u>	<u>Range</u>
Metallic Palladium Content	g / l	10	8.0 – 12.0
Temperature	°C	35	25 – 50
Density	°Be	8	6 – 12
pH		8.5	8 – 9
Cathode Current Density	A / dm <sup>2</sup>	1 ( Vat ) 0.4 (barrel) *3 (jet)	0.5 – 1.5 ( Vat ) 0.3 – 0.5 (barrel) 1 – 5 (jet)
Anode – to – Cathode Ratio		4 : 1	3 – 5
Agitation	m / min	4	3 – 5
Plating Rate	mgm / Amp - min	25	20 – 30
Time to deposit 1u at 0.5 A/dm <sup>2</sup> 35°C	min	5.5	4.0 – 8.0

\*\* the higher operating current density and cathode efficiency are depended on the jet speed and plating equipment design

## BATH MAINTENANCE

The Palladium metal content should be maintained at the recommended concentration ( 8.0 – 12.0 g/l ) by periodic additions of Pallmex 'P' Complex (100g/l pd). Pallmex PS1000 Replenisher Additives are supplied in unit form, each unit contains each of 500 mls Replenisher Brightener R1 and 150 grammes of Pallmex PS1000 Stabiliser Salt R2, each unit contains all the necessary agents to be added with the appropriate quantity of palladium complex corresponding to 100 grams of palladium metal.

Replenishment should be based on regular analysis but under optimum operating conditions. Pallmex PS1000 process deposit metal at the following rates.

<u>Amp – min</u>	<u>Palladium Consumed</u>	<u>Replenishment</u>
4000	100 grams metal	1 unit of Pallmex PS1000 Repl. Br. R1 & 1 unit of Pallmex PS1000 Stabiliser Salt R2

As drag out losses cannot be accounted for accurately, analytical checks should be performed periodically.

## **PACKING**

When ordering, reference should be made to the following Code Numbers :

PALLMEX PS1000 Make Up Electrolyte	20 litres / drum
PALLMEX PS1000 Replenisher Brightener R1	500 mls / unit
PALLMEX PS1000 Stabiliser Salt R2	150 g / unit
PALLMEX PS1000 Wetting Agent	1,2 litres / bottle
PALLMEX PS1000 Acid Adjustment Solution	1,2 litres / bottle
PALLMEX PS1000 Conducting Salt	1,2,5 kgs / bottle
PALLMEX PS1000 'P' Complex (100g/l pd metal)	0.5,1 or 5 litres/bottle