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# AUROMEX®

TECHNICAL

INSTRUCTIONS

DATA SHEETS

## AUROSIGN P220

### CYANIDE-FREE ALLOYED-GOLD ELECTROPLATING PROCESS

#### INTRODUCTION

**AUROSIGN P220** is a new cyanide free alloyed-gold electroplating process for high quality jewellery, spectacle frames, pens, pencils, lighters, watch cases and cutlery. Plated out of an alkaline medium, **AUROSIGN P220** solutions contain absolutely no cyanide, either free or complexed, based on an entirely new gold complex that contains no cyanide in any form. High alloy content, low specific gravity, even distribution characteristics and an exceptional throwing power make AUROSIGN P220 an extremely economic process to use. Increase throughput is obtained with a plating rate of 75 mgm/Amp-min.

(3.5 minutes to deposit 1 micron at 0.5 A/dm<sup>2</sup>)

AUROSIGN P220 produces mirror bright gold-palladium alloy of approximately 20-22 Karats that are uniform light yellow in colour. Hardness values in the range 300-350 Vickers prolong the fine appearance and value of AUROSIGN P220 coatings and eliminate wear point problems. The deposits are non-porous and resistant to tarnishing and corrosion.

#### PROCESS CHARACTERISTICS

- \* Excellent deposit distribution
- \* Extremely economic
- \* Very ductile
- \* Distinguished 20-22 Karat light yellow gold finish.
- \* Tarnish and corrosion resistant.

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**AUROMEX®**

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## **DEPOSIT CHARACTERISTICS**

- \* KARAT : 20-22
- \* HARDNESS : 300-350 HV
- \* SPECIFIC GRAVITY : 14.5-15.5 g/cc
- \* FOR 1u DEPOSIT : 145-155 mgm/dm<sup>2</sup> approx.

## **EQUIPMENT REQUIRED**

- TANKS : Polypropylene or PVC glass fibre reinforced tanks are suitable.
- HEATERS : Heating is required and temperature regulation is assential. Therefore, thermostatically controlled immersion heater are recommended.
- 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 provided a maximum current density of 0.25 A/dm<sup>2</sup> are recommended.

## **MAKE UP INSTRUCTION**

### **GOLD COMPLEX :**

For the preparation and maintenance of the solution, gold is added in the form of a liquid gold complex. Each litre unit contains 100 grams of gold metal.

### **PREPARATION OF SOLUTION :**

The following instructions are for the preparation of 10 litres of electrolytes.

### **MATERIALS REQUIRED :**

Gold Complex (100g/litre gold metal)	1 litre
AUROSIGN P220 make up concentrate (Code 9100)	2 litres
AUROSIGN P220 make up Brightener A (Code 9101)	500 mls.
AUROSIGN P220 make up Brightener B (Code 9102)	500 mls.
AUROSIGN Conditioner E (Code 8005)	
Potassium Hydroxide	

### **PROCEDURES :**

- (1) Pour 5 litres of demineralised or distilled water into the clean plating tank.
- (2) Add in the 2 litres make up concentrate (Code 9100), stir and then add the 500 mls make up Brightener A (Code 9101) and 500 mls make up Brightener B (Code 9102)
- (3) Check and adjust pH to 9.5 with 10% potassium hydroxide or AUROSIGN Acid.
- (4) Add in the 1 litre AUROSIGN Gold Complex, stir and check pH again.
- (5) Dilute the solution to 10 litres with demineralised or distilled water.  
The solution is then ready to use.

### **OPERATING CONDITION :**

	<b><u>UNIT</u></b>	<b><u>RANGE</u></b>	<b><u>OPTIMUM</u></b>
METALLIC GOLD CONTENT	g/l	6-10	10
METALLIC PALLADIUM CONTENT	g/l	0.5-2.0	1.5
pH, ELECTROMETRIC	°C	8.5-10.0	9.5
TEMPERATURE	°C	60-70	65
SOLUTION DENSITY	°Be	10-20	10
ANODE CURRENT DENSITY	A/dm <sup>2</sup>	0.25 max.	0.25 max.
CATHODE CURRENT DENSITY	A/dm <sup>2</sup>	0.4-0.6	0.5
ANODE : CATHODE RATIO		or higher	4:1
AGITATION	m/min	vigorous	vigorous
PLATING RATE(mgm/Amp-min)		70-80	75
TIME TO DEPOSIT 1u at 0.5 a/dm <sup>2</sup>	min	3.5-4.0	3.5

## **BATH MAINTENANCE**

Gold metal content of the solution should be maintained at the recommended concentration (6-10 g/l) by periodic additions of AUROSIGN Gold Complex.

"Replenishment material AUROSIGN P220 Replenisher pack is supplied as a liquid in units. Each unit contains 500 mls and 100 mls of AUROSIGN Replenisher Brightener A(Code 9105) and B (Code 9106), to be added with the appropriate quantity of gold complex corresponding to 100 grams of gold metal. Under optimum operating conditions, gold is consumed at a rate of approximately 100 grams of gold metal in 1470 Amp-mins.

## **pH CONTROL**

As the bath is used, the pH trends to drop and should be maintained between pH 9.0 and 10.0 electrometric. pH is raised through the use of 10% reagent grade potassium hydroxide solution. The AUROSIGN P220 bath is alkaline (pH = 9.5). The pH must not be allowed to drop below 8.0 since this will cause the solution to decompose.

## **BRIGHTENER ADJUSTMENT**

Normally, the Make Up and Replenisher materials contain enough brightening agent to maintain brightness of the deposit. If a slightly hazy deposit occurs, either with an operating or idle bath whose gold content is within recommended limits (and all other operating conditions are correct), a small addition of AUROSIGN Brightener E (Code 8005) should be made.

## **SOLUTION DENSITY**

To counter the effect excessive drag out, AUROSIGN P220 Conducting Salt (Code 9110) should be added to maintain the specific gravity at the optimum value. For every 14g/l addition of this conducting salt will increase 1 °Be at 60°C .

## **CONTROL OF IMPURITIES**

In general, any metallic contamination could interfere with the operation of the **AUROSIGN P220** bath although, in fact, these processes have a high tolerance to impurities. Introduction of metallic impurities into the bath should be prevented by proper rinsing of the parts to be plated and the use of a gold strike prior to gold plating is recommended.

## **PACKING**

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

<b>AUROSIGN GOLD</b> Complex (100 g/l gold metal)	500 mls/bot
<b>AUROSIGN P220</b> Make Up Concentrate (Code 9100)	2 litre/unit
<b>AUROSIGN P220</b> Make Up Brightener A (Code 9101)	500 mls/unit
<b>AUROSIGN P220</b> Make Up Brightener B (Code 9102)	500 mls/unit
<b>AUROSIGN P220</b> Replenisher Brightener A (Code 9105)	500 mls/unit
<b>AUROSIGN P220</b> Replenisher Brightener B (Code 9106)	100 mls/unit
<b>AUROSIGN P220</b> Conducting Salt (Code 9110)	2,5,10 or 20 /pack
<b>AUROSIGN</b> Conditioner E (Code 8005)	200 mls/unit
<b>AUROSIGN</b> Stabiliser Salt (Code 8130)	1 kg/pack
<b>AUROSIGN</b> Complexing Salt (Code 8135)	1 kg/pack
<b>AUROSIGN</b> Wetting Agent (Code 8136)	1,2,5 litre/bot