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# AUROMEX®

TECHNICAL

INSTRUCTIONS

DATA SHEETS

## DECORMEX 424C

### HIGH SPEED ACID HARD GOLD ELECTROPLATING PROCESS

#### INTRODUCTION

**AUROMEX DECORMEX 424C** is a new cobalt brightened high speed / high efficiency acid hard gold electroplating process specially formulated for high quality jewelry, spectacle frames, watch cases and cutlery.

DECORMEX 424C is based on an entirely new acid gold electrolyte that contains an effective cobalt complex. High efficiency, even distribution characteristics and an exceptional throwing power make DECORMEX 424C an economic process to use. Increased output is obtained with a plating rate of 55 mgm/amp-min (3.5 minutes to deposit one micron at 1.0 A/ dm<sup>2</sup>).

DECORMEX 424C produces mirror bright deposits of approximate 23.5 karats that are uniform rich yellow in color. There is no need to employ special additional finishing procedures with this process. Hardness values in the range 160-220 Vickers prolong the fine appearance and value of DECORMEX 424C coatings and eliminate wear point problems. The deposits are non-porous and resistant to tarnishing and corrosion.

#### PROCESS FEATURES

- \* Higher cathode efficiency and ability to plate thicker deposit.
- \* Excellent distribution and throwing power.
- \* Good corrosion resistance.
- \* Lower internal stress of deposits.
- \* Wear and abrasion resistant.
- \* Good tolerance to metallic impurities.
- \* Easy to operate.

#### DEPOSIT CHARACTERISTICS

Appearance	Mirror bright, lustrous deposit
Deposit purity	99.7% approx.
Karat	23.5 Karats
Hardness	160-220 mHv <sub>20g</sub>
Deposit density	17.5 – 18.0 g/cm <sup>2</sup>
For 1 micron deposit	175 – 180 mgm/dm <sup>2</sup>

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**AUROMEX®**

CHEMICALS CORPORATION

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## EQUIPMENT REQUIRED

Tank	Polypropylene or PVC glass fiber reinforced tank are suitable.
Heaters	Heating is required and temperature regulation is essential. Therefore, thermostatically controlled immersion heater are recommended.
Rectifier	A standard DC 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 0.25A/dm <sup>2</sup> are recommended.

## PREPARATION OF SOLUTION

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

Materials required :

Potassium Gold Cyanide (68.3%)	87.8 grams
<b>DECORMEX 424C</b> make up salt (Code 8010C)	1.5 kgs.
<b>DECORMEX 424C</b> make up Brightener (Code 8011C)	500 mls.
<b>DECORMEX</b> Acid (Code 8012C)	
Potassium Hydroxide	

Make up procedures :

1. Pour 6 litres of demineralised or distilled water into the clean plating tank.
2. Add in the 1.5 kgs. Make Up Salt (Code 8010C), stir until completely dissolved and then add the 500 mls. Make Up Brightener (Code 8011C).
3. Check and adjust pH to 4.5 with 10% potassium hydroxide or **DECORMEX** Acid.
4. Dissolve the gold potassium cyanide in a separate quantity of demineralised or distilled water and then add to the above solution.
5. Stir and check the pH again. Adjust pH to 4.5 if necessary with **DECORMEX** Acid or potassium hydroxide.
6. Dilute the solution to 10 litres with demineralised or distilled water. The solution is then ready to use.

## OPERATING CONDITIONS :

	<u>UNIT</u>	<u>RANGE</u>	<u>OPTIMUM</u>
Metallic gold content	g/l	4.0-8.0	6.0
pH electrometric		4.3-4.8	4.5
Temperature	°C	30-40	35
Cathode current density	A/dm <sup>2</sup>		
Still Vat plating		0.5-2.0	1.0
Barrel plating		0.2-0.4	0.2
Density	°Be	13-18	15
Anode : cathode ratio, Vat		3:1-5:1	4:1
Barrel		2:1-3:1	2:1
Agitation			vigorous
Plating rate	mgm/Amp-min	50-60	55
Time to deposit 1u at 1 A/dm <sup>2</sup>	min	3.0-4.0	3.5

## BATH MAINTENANCE

Gold metal content of the solution should be maintained at the recommended concentration (4-8 g/l) by periodic additions of gold potassium cyanide 68.3%. Replenishing Brightener is supplied as a liquid in units of 100 mls. One unit contains all the necessary agents to be added with the appropriate quantity of gold salts corresponding to 100 grams of gold metal.

Replenishment should be based on regular analysis but under optimum operating conditions; **DECORMEX 424C** process deposit metal at the following rates.

<u>Amp-min</u>	<u>Gold consumed</u>
1860	100 grams

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

For every 100 grams gold replenishment (147 grams 68.3% PGC) add one units (100 mls.) **DECORMEX 424C** Replenishing Brightener (Code 8045C).

**CONDUCTIVITY** : Specific gravity of the solution should be maintained between 13-18 Brume. If for any reason excessive drag out occurs, and the specific gravity of the solution drops below 12 °Be, conducting salts (Code 8050C) should be added to the solution. For every 16 g/l addition of this conduction salt will increase 1 °Be at 35°C.

**pH ADJUSTMENT** : The pH of the solution will rise slowly during use and should be checked periodically. To lower the solution pH by addition of **DECORMEX** Acid. To increase pH by addition of 10% w/v potassium hydroxide.

## **CONTROL OF IMPURITIES**

In general, any metallic impurities could interface with the operation of the DECORMEX gold bath. Introduction of metallic impurities into the bath should be prevented by proper rinsing of the parts to be plated and a DECORMEX S-100 gold strike prior to gold plating.

## **PACKING**

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

<b>DECORMEX 424C</b> Make Up Salt (Code 8010C)	1.5 kgs/unit
<b>DECORMEX 424C</b> Make Up Brightener (Code 8011C)	500 mls/unit
<b>DECORMEX 424C</b> Replenishing Brightener (Code 8045C)	100 mls/unit
<b>DECORMEX 424C</b> Conducting Salt (Code 8050C)	1,2,5 kgs/pack
<b>DECORMEX 424C</b> Special Conducting Salt (Code 8055C)	1,2,5 kgs/pack
<b>DECORMEX 424C</b> Acid (Code 8012C)	1,2,5 kgs/pack