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# AUROMEX®

TECHNICAL

INSTRUCTIONS

DATA SHEETS

## **DECORMEX N-SUPER** **HIGH EFFICIENCY ACID HARD GOLD ELECTROPLATING PROCESS**

### **INTRODUCTION**

**AUROMEX DECORMEX N-SUPER** is a new complexed metallic brightened high efficiency acid hard gold electroplating process specially formulated for high quality jewelry, spectacle frames, watch cases and cutlery.

DECORMEX N-SUPER is based on an entirely new acid gold electrolyte that contains an effective metallic complex. High efficiency, even distribution characteristics and an exceptional throwing power make DECORMEX N-SUPER an economic process to use. Increased output is obtained with a plating rate of 35 - 45 mgm/amp-min (4.0 - 6.0 minutes to deposit one micron at 1.0 A/ dm<sup>2</sup> depends on the operating temperature).

DECORMEX N-SUPER produces mirror bright, extreme hard, ductile deposits of approximate 22.5 karats that are uniform pale yellow in color. There is no need to employ special additional finishing procedures with this process. Hardness values in the range 300 - 350 Vickers prolong the fine appearance and value of DECORMEX N-SUPER 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       | 94 - 97% approx.                |
| Karat                | 22.5 - 23.0 Karats              |
| Hardness             | 300 - 350 mHv <sub>20g</sub>    |
| Deposit density      | 16.5 – 17.5 g/cm <sup>2</sup>   |
| For 1 micron deposit | 170 – 175 mgm/dm <sup>2</sup>   |
| Color of deposit     | Hamilton 7                      |

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**AUROMEX®**

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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 step-less 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%)                           | 58.5 grams |
| <b>DECORMEX N-SUPER</b> make up salt (Code 8230)         | 1.7 kgs.   |
| <b>DECORMEX N-SUPER</b> make up Brightener A (Code 8231) | 500 mls.   |
| <b>DECORMEX N-SUPER</b> make up Brightener B (Code 8232) | 100 mls.   |
| <b>DECORMEX</b> Acid (Code 8032)                         |            |
| Potassium Hydroxide                                      |            |

Make up procedures :

1. Pour 6 litres of de-mineralized or distilled water into the clean plating tank.
2. Add in the 1.7 kgs. Make Up Salt (Code 8230), stir until completely dissolved and then add the 500 mls. Make Up Brightener A (Code 8231) and 100 mls. Make Up Brightener B (Code 8232).
3. Check and adjust pH to 4.2 with 10% potassium hydroxide or **DECORMEX** Acid.
4. Dissolve the gold potassium cyanide in a separate quantity of de-mineralized or distilled water and then add to the above solution.
5. Stir and check the pH again. Adjust pH to 4.2 if necessary with **DECORMEX** Acid or potassium hydroxide.
6. Dilute the solution to 10 litres with de-mineralized 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               | 3.0-6.0      | 4.0            |
| Metallic nickel content                   | g/l               | 4.0-5.0      | 4.0            |
| pH electrometric                          |                   | 4.0-4.5      | 4.2            |
| Temperature                               | °C                | 30-50        | 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       | 30-45        | 38             |
| Time to deposit 1u at 1 A/dm <sup>2</sup> | min               | 4.0-6.0      | 4.5            |

## BATH MAINTENANCE

Gold metal content of the solution should be maintained at the recommended concentration (3-6 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 N-SUPER** process deposit metal at the following rates.

| <u>Amp-min</u> | <u>Gold consumed</u>       |
|----------------|----------------------------|
| 2710           | 100 grams (at 35°C, 1 ASD) |

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 N-SUPER** Replenishing Brightener (Code 8275).

**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 8050) 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 N-SUPER</b> Make Up Salt (Code 8230)            | 1.7 kgs/unit      |
| <b>DECORMEX N-SUPER</b> Make Up Brightener A (Code 8231)    | 500 mls/unit      |
| <b>DECORMEX N-SUPER</b> Make Up Brightener B (Code 8232)    | 100 mls/unit      |
| <b>DECORMEX N-SUPER</b> Replenishing Brightener (Code 8275) | 100 mls/unit      |
| <b>DECORMEX N-SUPER</b> Conducting Salt (Code 8050)         | 1,2,5 kgs/pack    |
| <b>DECORMEX N-SUPER</b> Special Conducting Salt (Code 8055) | 1,2,5 kgs/pack    |
| <b>DECORMEX N-SUPER</b> Acid (Code 8032)                    | 1,2,5 litres/pack |