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# AUROMEX®

TECHNICAL

INSTRUCTIONS

DATA SHEETS

## SILVAMEX BS MIRROR BRIGHT BARREL SILVER PLATING PROCESS

### INTRODUCTION

The **AUROMEX SILVAMEX BS** silver plating process is specially designed for barrel plating hard mirror bright deposits over a much wider range of current densities. This process is advantageous to many applications either decorative or industrial. The use of high current densities leads directly to productivity, which is of primary importance when economics is the basic consideration.

### FEATURES

- \* Mirror Bright finish deposits.
- \* Deposits are hard, highly ductile and good wear resistance.
- \* Wider operating current densities, uniformly deposits from 0.1 to 4 Amp/dm<sup>2</sup>
- \* Non-critical, economical operation and control.
- \* No accumulation of deleterious brightener decomposition products.
- \* Exceptional throwing and covering power.
- \* High electrical conductivity.
- \* Easy to operate.

### PLATING BATH PREPARATION

**AUROMEX SILVAMEX BS** make up agent is supplied in unit form. Each unit contains all the products required to make 10 liters of solution. It does not contain silver.

The following instructions are for the preparation of 10 liters of solution.

#### MATERIAL REQUIRED :

SILVER Potassium Cyanide (54%)	440 gms.
<b>SILVAMEX BS</b> Make Up Salt (Code 14330)	1.5 kgs.
<b>SILVAMEX BS</b> Make Up Brightener (Code 14331)	100 mls.

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**AUROMEX®**

CHEMICALS CORPORATION

UNIT NO. 2, 4/F., INTERNATIONAL PLAZA, 20 SHEUNG YUET ROAD, KOWLOON BAY, KOWLOON, H.K.  
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## PROCEDURES :

- (1) Fill to a clean plating tank 2/3 of the required final volume with distilled or non-ionized water.
- (2) Add in the 1.5 kgs **SILVAMEX BS** Make Up Salt (Code 14330), stir unit completely mixed.
- (3) Dissolve the silver Potassium Cyanide (54%) in a separate quantity of de-mineralized or distilled water and then add to the above solution.
- (4) Add in the **SILVAMEX BS** Make Up Brightener (Code 14331).
- (5) Dilute the solution to 10 liters with de-mineralized or distilled water, the solution is then ready to use.

## OPERATING CONDITION

	<u>UNIT</u>	<u>RANGE</u>	<u>OPTIMUM</u>
Silver metal	g/l	16 – 30	24
KCN (Free)	g/l	90 – 110	100
K <sub>2</sub> CO <sub>3</sub>	g/l	15 – 60	20
pH		12 – 12.5	12.3
Temperature	°C	25 – 30	28
Cathode Current Density (barrel)	A/dm <sup>2</sup>	0.3 – 1.0	0.5
Deposition rate	min / u	1 micron in 4.0 minutes at 0.5A / dm <sup>2</sup>	
Anode		Fine grained extruded 99.9% silver	
Anode : Cathode ratio		2 : 1 minimum	
Agitation		Moderate to vigorous	
Current efficiency (barrel)		40 – 50%	

## EQUIPMENT

Tanks	Steel lined with suitable plastic material such as polyethylene, Tygon, polyvinyl chloride, Koroseal and glass containers are recommended.
Heaters	Not normally required but a stainless steel immersion heater with thermostat control.
Filtration	Preferably continuous using filter paper stacks or woven nylon or polypropylene cartridges.(capacity of approx.1-2 times tank volume per hour.)
Agitation	The most suitable method of providing agitation is by means of a moving cathode bar arrangement. In additions, particularly in cases of continuous operation, moderate circulation of the solution by means of a pump is most desirable.

## SOLUTION MAINTENANCE

### Silver metal:

The silver content should not be allowed to drop below 16 gram per liter. Below this figure, because of lack of sufficient silver ions the tendency for dullness at the high current density areas will increase. During the operation, the silver anodes normally maintain the silver content. Sufficient anodes should be used in the tanks so that the anode current density does not at any time exceed about 12 amperes per square foot. A ratio of cathode to anode area of 1 to 2 is highly desirable.

### Potassium cyanide:

To obtain optimum brightness, it is important to maintain the free cyanide at a minimum of 95 g/l. Below this value, there is a tendency for dullness to develop in regions of low current density.

### Potassium carbonate:

As in all cyanide baths, carbonates build up. The carbonate content may reach a value of 80 g/l without adverse effect.

### SILVAMEX BS REPLENISHING BRIGHTENER:

This is the active additive for maintaining bright deposits. Additions are made on the basis of the number of ampere hours passed through the solution. For each 100 ampere hours. add 100 mls. **SILVAMEX BS** Replenishing Brightener .

### STRIKE SOLUTION:

A silver strike should be used prior to silver plating. A typical formula is as follows :

AgCN	1.5 - 3.5 g/l
KCN	100 - 115 g/l