AG-ECO

100% CYANIDE FREE SILVER PLATING BATH 25G/L (KIT 1L A + 1L B) - PKG. 1L

DESCRIPTION

AG-ECO is a silver-plating electrolyte for bath plating which provides for a new and completely cyanide-free approach to silver electroplating. When comparing to traditional silver-plating methods which can contain up to 200 grams of potassium cyanide per liter, this plating solution provides a perfect resolution to common cyanide restrictions immerging from place to place throughout in the international community. Moreover, the complete absence of cyanide provides for healthier working conditions for plating operators as well as reduces environmental concerns in the form of waste water and waste water treatment. ECO-Silver is a two-part process commercially available in a kit. Part A being the silver solution and Part B being the post treatment. The solution works at low current densities and can obtain a plating thickness up to 20 micron. The final deposit is bright, 99.9% pure silver, and does not have to be polished after deposition. This silver-plating solution can be used in both decorative and technical plating applications.

- Silver plating solution
- 100% cyanide-free
- Thicknesses from 0.2 to 20 Microns
- Ideal using the bath until exhaustion

DEPOSIT DATA

Purity (%)	99.9
Hardness [HV 0.01]	80
Density [g/cm³]	10.5
Thickness from-to [µm]	0.02 - 20
Aspect	Shiny
Color	Silver

PRODUCT FORM

Metal concentration	25 g Ag/l
Product pH	Alkaline
Format	Ready to use liquid
Color of the product	Colorless
Storage time	2 years
Volume	KIT (part A: 25 g Ag/l + part B: 1 L post silver solution)

PRODUCT USAGE	RANGE	OPTIMAL
Voltage [V]	0.1 - 1.0	0.5
Current density [A/dm²]	0.1 - 2.0	1.0
Working temperature [°C]	20 - 30	25
Treatment time [min]	1 - 30	10
pH	10 - 11	10.5
Solution density [°Bé]	10 - 14	12
Anode/cathode ratio	2:1 - 4:1	3:1
Anode type	Pure AG	
Stirring	Moderate	

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METAL CONCENTRATION

METAL (g/l)	RANGE	OPTIMAL
Ag	20 - 25	25 g Ag/l

COLOR COORDINATES

L *	97.7
a*	-1.2
b*	2.7

Note:
Color coordinates here reported have been measured on a white underlayer and they are to be intended as PURELYINDICATIVE being strongly dependent on underlayer color, on thickness of the deposit and on specific design(shape)of the surface.

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USER GUIDE

READY TO USE SOLUTION PREPARATION

AG-ECO is a kit composed by:

A) AG-ECOA: ready-to-use cyanide free silver plating solution at the concentration of 25 g/l. No preparation is required.
B) AG-ECOB: concentrated post cyanide-free silver plating solution sold in 1 liter bottle. In order to use the post silver solution at maximum performance we suggest diluting it 20 times. For this reason, to prepare 1 liter ready for use of post silver treatment solution withdraw 50 ml of AG-ECOB and dilute it 20 times up to 1 final liter. Reprepare another new liter by using new 50 ml of AG-ECOB once it is verified that its whitening action in not so efficient as at the beginning of its usage.

ANODES

For this type of plating solution use pure silver 99.9% anodes.

WORKING TANK MATERIALS

For small volume amount solutions - in beaker scale-use Pyrex glass; vice versa use PP /PVC/HDPE tanks for larger volumes and equipped with an efficient exhaust fume/suction or aspiration system.

DC POWER - RECTIFIER

Use a current DC rectifier having an alternate current residue –ripple– less than 5% and having an output amperage enough to obtain a proper electroplating process. The rectifier should be equipped with:

- Amperemeter
- Voltmeter
- Ampere/minutes counter (for bigger installations only).

As the processworks at lower current density values, we recommend the use of a rectifier which permits to set low values of both voltage and amperage with good sensibility.

HEATING SYSTEM

The admitted materials for heaters are: Pyrex, quartz or PTFE.

FILTRATION AND MOVEMENT

For bigger plating installations (>5 liters) it is advisable to keep the plating solution continuously filtered and in movement through a magnetic driven filter pump with 5-15 µm cartridges in PP that must have been previously conditioned by boiling them for at least 3 hours and then washed with DI water in order to prevent any possible organic contamination.

PLATING SOLUTION MAINTENANCE

As this Silver plating solution has been thought for small sizes /volumes bath only (up to 5 liters) AG-ECO can be used until the silver plating solution is completely exhausted without adding any concentrate replenisher. Remember that silver plating solution will automatically restored in silver by anode dissolution but in any case it has to be remembered that anodic efficiency will be less than cathodic so the plating solution will arrive at a certain point that the silver solution will be low than optimum conditions; while post treatment solution has to be used diluted 20 times so with 1 liter of AG -ECO1B supplied with the AG-ECO kit it will be possible to run until 20 turnover of post treatment.

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PRETREATMENTS

To maximize the AG-ECO silver plating process we strongly recommend that the pieces, especially nickel plated, should be pre treated with a pre-silver process or pre-palladiated. In case of pre-silver-plated pieces which show tarnish on the surface, we recommend to dip them in the cleaning

antioxidant liquid STEP1 prior to apllication of the silver. AG-ECO can be deposited directly onto Silver, Palladium, Gold, Nickel and its alloys. An intermediate deposit or precious metal plating strike (Ag, Au or Pd) is necessary before depositing onto Tin, Lead, Zinc, Cadmium, Aluminum and Iron. Generally, we suggest to start with a ultrasonic degreasing process followed by rinse and subsequent electrolytic degreasing step (i.e. SGR1) at 5-6 V for 1-2 minutes. Neutralize them by dipping the items in acidic solution 5% sulphuric acid or with something similar (i.e. NEUT1) and then rinse again with pure water.

POST TREATMENTS

It is of fundamental importance, after the silver plating to follow these steps: items come out from the silver solution greyish-blueish after plating so you must always follow the silver plating process with the mandatory post treatment process by dipping the pieces just silver plated inside the AG-ECO1B diluted solution at 60°C for some seconds until getting a complete white finishing. THIS SOLUTION WORKS IN ABSENCE OF CURRENT (electroless). In order to maximize the performance of the posttreatment solution AG-ECOB, it is advisable to dilute it 20 times: prepare 1 liter ready-to-use post treatment solution by diluting with 950 ml of D.I. water 50 ml of AG-ECOB solution as received. FOR THE POST TREATMENT PROCESS WE RECOMMEND the following procedure: A) After the silver plating, wash with current water; B) wash 1-2 more times in deionized water at room temperature; C) submerge in AG-ECOB diluted post plating solution at 60°C leaving the silver plated pieces inside for some seconds until getting a complete white finishing; D) remove the pieces form the post treatment solution; E) then appearing bright and shiny double wash again in deionized water; F) Passivate worked items with T-PRO (see related TDS). If this step will not be done, the silver-plated surfaces will suffer tarnish in a short time.

WATER PURITY

To prevent contamination of the plating solution during any replenishing operations, use demineralized water with a conductivity of less than 3 µS/cm (containing no traces of organic compounds, Chlorine, Silicon, or Boron). To achieve maximum deposit quality we suggest to use our high- grade purity WATER.

SUPPLEMENTARY INFORMATION

IMPORTANT: Avoid the direct exposure of the AG-ECOA solution to the external light when it is not working, in order to prevent silver precipitation as oxide from the plating solution. The items to be plated have to be prepared according with thenormal practice.

SAFETY INFORMATION

AG-ECO process is a chemical solution totally cyanide free and for this reason is not particularly dangerous for theoperator neither for the external environment. In any case we cann ot exclude completely possible irritating effects on the skin, eyes, and mucous membranes. Caution must be observed while using the product avoiding direct contact with eyes and skin. For further information please refer to the relative Material Safety Data Sheets.

DISCLAIMER

All recommendations and suggestions in this bulletin concerning the use of our products are based upon tests and data believed to be reliable. Since the actual use by others is beyond our control, no guarantee expressed or implied, is made by Legor Group, its subsidiaries of distributors, as to the effects of such use or results to be obtained, nor is any information to be construed as a recommendation to infringe any patent.

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