

GFRED-ECO

READY TO USE CYANIDE FREE FLASH PLATING BATH 1G/L PINK GOLD COLOR

DESCRIPTION

GFRED-ECO is a mild alkaline flash gold plating electrolyte that deposits a uniform, bright layer in red gold. The final color produced can be considered a high-end fashion red gold color while corresponding to the normalized NIHS standard 6N gold. Though the solution is a mild alkaline formula, it functions without the help of potassium cyanide, therefore there are no free cyanides in the solution. This makes for a safer and non-toxic approach to electroplating. The alloy deposited is more complex than standard red gold plating solutions making GFRED-ECO more resistant to tarnish or oxidization. This red gold plating solution is intended for decorative use as the maximum thickness obtainable is 0.2 micron. This red gold plating solution is Nickel, Lead, and Cadmium free.

- Red gold plating solution
- Greater tarnish resistance
- No free cyanides

DEPOSIT DATA

Purity (%)	99.9
Hardness [HV 0.01]	160 - 220
Density [g/cm ³]	19.0
Thickness from-to [µm]	0.02 - 0.20
Aspect	Shiny
Color	Red

PRODUCT FORM

Color of the product	Blue
Metal concentration	1 g/l
Format	Ready to use
Product pH	Alkaline
Storage time	2 years
Volume	1 L

PRODUCT USAGE	RANGE	OPTIMAL
Stirring	Moderata	
Solution density [°Bé]	3 - 6	4 - 5
Current density [A/dm²]	0.5 -5.0	2.0
Cathodic efficiency [mg/Amin]	8 - 14	10
pH	10 - 11	10.5
Anode/cathode ratio	> 1:1	
Working temperature [°C]	50 - 60	55
Treatment time [sec]	30 - 50	40
Anode type	Ti/Pt o Acciaio inox	
Voltage [V]	4.0 - 6.0	5.0

METAL CONCENTRATION

METAL	RANGE	OPTIMAL
Au	0.6 - 1.0	1.0

COLOR COORDINATES

L *	85.3
a*	10.5
b*	14.8
c*	19.9

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.

RELATED PRODUCTS - MAINTAINING

AUS683.100G*	Replenisher salt for gold plating 68.3 g Au/100 g
GF10AUR.100ML*	Gold replenisher for GF gold plating series 10 g/100 ml
GFAGR-ECO.1L	Silver replenisher for GFRED-ECO 1 g Ag/l
GFCUR-ECO.1L	Copper replenisher for GFRED-ECO 1 g Cu/l

* Product which is subject to the international regulations concerning transportation of dangerous goods

USER GUIDE**READY TO USE SOLUTION PREPARATION**

GFRED-ECO is a ready-to-use plating solution at the concentration of 1 g/l of gold. No preparation is required. Pour it directly into working tank, heat it up to the preset temperature and once reached start to plate.

ANODES

Use Titanium Platinized anodes with a layer in platinum not lower than 1.5 µm. Alternatively, it is also possible to use Stainlesssteel AISI 304 or 316 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 (the gold plating solution might develop potentially toxic or harmful fumes that can also be irritant if inhaled or with allergenic effects).

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).

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 to prevent any possible organic contamination.

PLATING SOLUTION MAINTENANCE

As general guideline considers adding 10 g of fine gold every 1000 Amin while silver and copper needs to be added according with chemical analysis. In general, we can say that this process is easy to maintain but will initially requires frequent analytical controls to obtain a correct concentration level of all the metals present. In fact, metal concentrations strongly influence the final deposited color; therefore, an incorrect management of these parameters shall inevitably lead to unwanted colors. Some general guidelines for maintenance are below described:

- Adding GFAGR-ECO will lead the color towards green-/pale hues.
- Adding GFCUR-ECO will lead the color towards red/pink hues.
- Adding AUS683 salts or GF10AUR solution will restore the gold content more than take the color towards yellow hues.

ITEMS AND PLATING SOLUTION MOVEMENT

For maximum performance, especially in terms of color, do not use excessive agitation. For bigger tanks it is advisable the use of a magnetic driven pump with a not too much high feed; while for lower volumes it will be sufficient just the moderate agitation for items to be gilded.

ABOUT pH

pH needs to be maintained within optimum values. If it will be necessary to raise it add slowly concentrate potassium hydroxide solution (20-30%) vice versa add 20-30% of a phosphoric acid solution to lower, it (the latter possibility happens rather seldom).

PRETREATMENTS

This gold plating solution for flash application can be directly deposited directly on Gold, Silver, Palladium, other precious metal substrates and Nickel. For other metals (i.e. Copper and its alloys or Silver) it is necessary to make an intermediate deposit of Palladium or Nickel to prevent copper migration. An intermediate deposit or precious metal plating strike is necessary before depositing onto Tin, Lead, Zinc, Aluminum, and Iron-based materials in general.

As pre-treatment it is suggested to run a preliminary degreasing through a cycle of ultrasonic degreasing treatment -solution followed by a wash step into running water. Then proceed with the electrolytic degreasing step by using the alkaline degreasing solution SGR1. Once the items has been washed again in demineralized water, then proceed in activate and neutralize the surface of the same by dipping them into the slightly acidic solution NEUT1 for 3-4 times subsequently at room temperature, in order to be sure that no any alkaline residues coming from the degreasing previous steps are dragged into the solution together with the same items to be treated (which would lead to a reduction of its life). After the neutralization, wash in demineralized running water and immerse the pieces in the gold plating solution for the plating treatment.

POST TREATMENTS

The electrolyte should be removed from the surface as quick as possible. Wash off the plating solution residues in a recovery rinse (static rinse). Rinse the parts in circulating deionized water and dry. A possible last rinse in hot static water before dry can help in gain more brightness and luminosity.

WATER PURITY

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

SAFETY INFORMATION

AVOID ANY DRAG IN OF ACIDS IN GOLD PLATING SOLUTION TO AVOID THE DEVELOPMENT OF HIGHLY TOXIC FUMES! Being an alkaline solution, the electrolyte is an irritant to the skin, eyes and mucous membranes. Caution should be exercised when using the product, avoiding contact with the eyes and skin. Use gloves and safety goggles. Keep away from acid-based chemicals. For further information please refer to the relative MSDS.

DISCLAIMER

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