

**Technical data sheet and product guideline**



**GFRED-ECO**

**Red gold solution for bath plating 1 g/l (ready-to-use)**

**Color coordinates**



L	<b>85.5</b>
a	<b>10.4</b>
b	<b>17</b>
c	<b>19.9</b>

**Product form**

Metal concentration	<b>1 g/l (Au)</b>
Form	<b>Liquid</b>
Material color	<b>Blue</b>
Storage time	<b>2 years</b>
Format	<b>Ready to use</b>
Chemical type	<b>Alkaline</b>
Volume	<b>1 liter</b>

**Operating data**

	Range	Optimal
Voltage (V)	<b>4.0-6.0</b>	<b>5</b>
Current density (A/dm <sup>2</sup> )	<b>0.5-5.0</b>	<b>2.0</b>
Working temperature (°C)	<b>50-60</b>	<b>55</b>
Exposure time (sec)	<b>30-50</b>	<b>40</b>
pH	<b>10.00-11.00</b>	<b>10.50</b>
Cathode efficiency (mg/Amin)	<b>8-14</b>	<b>10</b>
Anode/cathode ratio	<b>&gt;1:1</b>	
Anode type	<b>Platinized titanium</b>	
Agitation	<b>Moderate</b>	

**Metal concentration**

Metal	Range (g/l)	Optimal (g/l)
Gold	<b>0.5 - 1.5</b>	<b>1.0</b>

**Deposit data**

Purity (%)	<b>99.9</b>
Hardness (HV 0,01)	<b>90-100</b>
Density (g/cm <sup>3</sup> )	<b>19</b>
Thickness (um)	<b>0.1-0.2</b>
Appearance	<b>Shiny</b>
Color	<b>Red</b>

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**Preparation**

GFRED-ECO is a ready-to-use plating bath at the concentration of 1 g/l of gold. No preparation is required while filling the working tank.

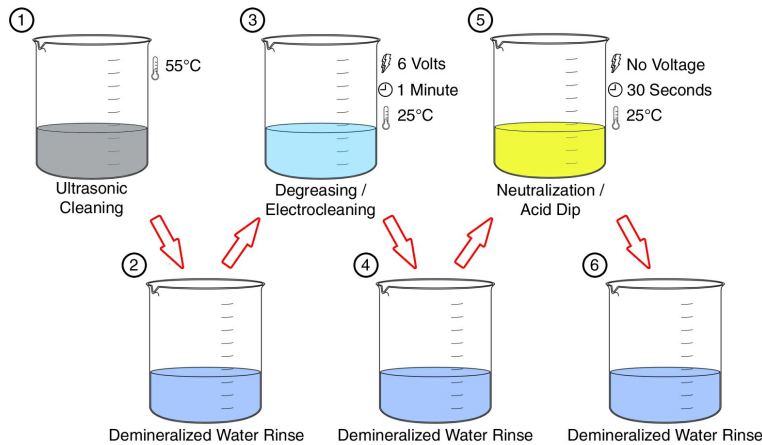
**Equipment**

Working vessel materials: Pyrex glass / PVC / polypropylene  
 Power supply: DC current rectifier with low residual AC (<5%)  
 Heating element  
 Anode type: Platinized titanium [1.5-2.5 µm] or stainless steel

**For larger bath volumes:**

Magnetic driven filter pumps with 5-15 µm cartridge (before use, boil and wash the cartridges with demineralized water for 3 hours to prevent organic contamination)  
 Amp/min counter.

**Pre treatment**



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### Bath maintenance

#### Temperature and pH

Best performances are obtained within a working temperature of 50-60°C. Optimum pH value is 10.5; nevertheless it is acceptable when kept between 10.0 and 11.0. If necessary correct by adding 25% phosphoric acid solution to lower the pH or by adding 25% potassium hydroxide to raise the pH.

#### Analytical controls

This process is easy to maintain, but it initially requires frequent analytical controls in order to obtain a correct concentration level of all the metals present. Clearly, metal concentrations greatly influences the final color deposited; therefore, incorrect management of these parameters shall inevitably lead to unwanted color shades. Some general guidelines for maintenance are described below:

- Adding GFAG-ECO will lead the color towards white/pale hues.
- Adding GFCU-ECO will lead the color towards red/pink hues.
- Adding AUS683 salts or GF10AUR solution will lead the color towards yellow hues besides to restore the gold content of the plating solution.

### Post treatment

Electrolyte should be removed from the surface as quick as possible. Rinse off the bath rests in a recovery rinse (still rinse). Rinse the parts in circulating deionized water and dry.

### Water purity

To prevent contamination of the bath both during its preparation and any subsequent replenishing operations, use demineralized water with a conductivity of less than 3 µS/cm (containing no traces of organic compounds, Chlorine, Silicon, or Boron).

### Safety information

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.

### Additional hints

For maximum performance and in particular in terms of resulting color do not use an excessive agitation. A moderate agitation of the pieces to be plated will be sufficient. For larger volumes it is sufficient the use of a magnetic drive filter pump with a not too much high capacity.

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**Product correlations**

<b>GFRED-ECOC</b>	Concentrated GFRED-ECO solution 1 g/100 ml	<b>AUS683</b>	Gold replenisher in salt form (100 g, Gold title: 68.3%)
<b>GF10AUR</b>	Gold replenisher solution 10 g/100 ml	<b>GFRED-ECOR</b>	All inclusive replenishment for GFRED-ECO 1 g/100 ml
<b>GFCUR-ECO</b>	Copper replenishing solution for GFRED-ECO 10 g/l	<b>GFAGR-ECO</b>	Silver replenishing solution for GFRED-ECO 1 g/l
<b>GF-SF</b>	Conductive salts for gold flash plating solutions (1 kg)		

**Packaging**

