24K Bright Gold Plating Solution

Gold Plating Services’ 24K Bright Gold Plating Solution is cobalt hardened acid gold electroplating solution that will yield a relatively low stress, fine grained deposit with hardness range of 130-200 Knoop. This solution is ideally suited for printed circuit boards, contacts, reflectors, as well as heavy decorative deposits.

The purity and hardness of the final electrodeposited gold will be equivalent to Type I, and 2, Grade C, specifications as indicated in MIL-G-45204C, as follows:

- **Fine gold content**: Varies – range from ¼ to 1 Troy oz per gallon
- **Purity**: 99.7 percent gold minimum (24 karat)
- **Hardness**: Knoop hardness 130-200
- **Density of Plate**: 12.45 mg/in²/µm (thickness)

**Theoretical Coverage**

Assuming a gold content of 4 grams fine gold per liter of solution, coverage would be ~ 1600 in²/liter with the gold plated to an average decorative thickness. A gold plating thickness of 8 - 10 micro-inches is a common thickness for decorative gold plating and exceeds the US Federal Trade Commission standards for (non-jewelry), gold plated items to be marketed as “gold plated”.

*This coverage is based on the assumption that all gold in the solution will be deposited. In actual practice this is not likely since the cathode efficiency diminishes with metallic content depletion making the solution unusable at extremely low metallic content. As the solution is depleted the cathode efficiency will diminish as shown on the Depletion Table found at [http://www.goldplating.com/chemicals/24KBrightGoldDepletionTable.htm](http://www.goldplating.com/chemicals/24KBrightGoldDepletionTable.htm).

- **Purity**: 99.7%+
- **Hardness**: 130 - 200 Knoop
- **Solution gold content**: .25 - 1 troy oz per gallon
  - Varies – range from ¼ to 1 Troy oz per gallon (2 - 8.22 grams/liter)

Gold Plating Services
378 North Main #112, Layton, Utah 84041
Tel. (801) 546-6200  Fax (801) 546-9449  www.goldplating.com
Range

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>90 - 105 ° F – optimum is 100° F</td>
</tr>
<tr>
<td>Anode to Cathode ratio</td>
<td>2:1 or higher</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>11 - 16 Be</td>
</tr>
<tr>
<td>pH (electrometric)</td>
<td>4.2 - 4.8</td>
</tr>
<tr>
<td>Time to deposit 0.00004&quot; (~ 1 micron)</td>
<td>8 - 10 minutes @ 6 Amperes per square foot, (ASF)</td>
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</tbody>
</table>

Replenishment

Add 24K Bright replenisher as required to maintain metallic content at desired levels. See depletion table

Filtration

Continuous

Efficiency at normal operation gold content

20% - 38% (with increased metallic content efficiency can reach 38%)

Current Density - cathode

5 - 15 Amperes/ft², (35 - 105 ma/in²)

Anode material

316 Stainless Steel, Platinized Columbium, Platinized Titanium or graphite

Agitation

cathode movement or solution pumping

Tank, pump and tubing material

glass, polyethylene, polypropylene or other material inert to solution.

Note: pH will slowly rise during operation and should be checked every 100-ampere minute with a glass electrode pH meter. To lower the pH use reagent grade phosphoric acid diluted, (10%), in DI water. To raise the pH use dilute, (20%), reagent grade potassium hydroxide dissolved in DI water.

Before using with this solution, plastic tanks, tubing, pumps, etc. should have a 5 to 10% solution of sulfuric acid allowed to remain in the tank for 24 hours. Run the acid solution through the tank and in the filter system for 2 hours. Drain and rinse the tank and filter thoroughly. Repeat rinsing with fresh water until pH is above 4.5.

Read and understand MSDS sheets before using: For professional use by trained technicians only.