


GENERAL INFORMATION

RU5GRAY is a ruthenium plating electrolyte which deposits an abrasion resistant layer of ruthenium metal in a titanium gray color. The gray color produced is that of pure ruthenium as the solution does not contain any additional organic additives for darkening purposes. This lack of additional chemical makes RU5GRAY the fastest depositing ruthenium, functional at lower than optimal temperatures. This acidic based compound is primarily used in decorative plating applications for a diverse color option in the case where corrosion resistance is also a requirement. The plating deposit is durable and can reach a maximum thickness of 0.2 micron. Due to the fact ruthenium has a lower conductivity than other precious metals, the electrolyte requires a greater metal concentration to function optimally.

Product form

Metal concentration	5 g/l (Ru)
Product's pH	Acidic
Solution form	Liquid
Solution form	Ready-to-use
Plating solution color	Black
Storage time	2 years
Volume	1 liter

Deposit data

Purity (%)	99.9
Solution appearance	Shiny
Hardness [HV 0.01]	400-700
Density [g/cm ³]	10.5
Plating solution color	Grey
Thickness range [µm]	0,02 - 0.20


Operating data
RANGE
OPTIMAL

	RANGE	OPTIMAL
pH	0.8-1.5	1.0
Voltage [V]	1.8-2.2	2.0
Current density [A/dm ²]	0.5-2	1.0
Working temperature [°C]	50-70	60
Exposure time (sec)	60 - 360	240.0
Cathode efficiency [mg/Amin]	1-5	3.0
Anode-cathode ratio	1:1-4:1	2:1
Anode type	Platonized titanium	
Agitation	Strong	

Metal concentration
METAL
RANGE (g/l)
OPTIMAL (g/l)

Ruthenium

3-10

5.0

Color coordinates

L*	72.1
a*	0.6
b*	2.9
c*	2.9

**PREPARATION**

RU5GRAY is a ready-to-use galvanic bath at the concentration of 5 g/l. No preparation is required.

EQUIPMENT

Working vessel: 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].

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

RU5GRAY can be deposited directly onto Palladium, Gold, Nickel and its alloys. An intermediate deposit or precious metal plating strike is necessary before depositing onto Tin, Lead, Zinc, Cadmium, Aluminum and Iron.

Copper and alloys containing copper provide the poorest layer for ruthenium adhesion and the metals together run a high risk metal diffusion which should be avoided. Separate the layers with intermediate deposits of white bronze or nickel when applicable and palladium.

POST TREATMENT

The electrolyte should be removed from the surface as quick as possible.

1. Wash off the bath residual in a recovery rinse (still rinse) followed by
2. Wash the article in hot distilled water (80°C).
3. Rinse the parts in circulating or running water.
4. Dry

In the case a problem is observed, replace step #2 with a 50% cold ammonia solution rinse for 5 minutes. This action should be performed under an exhaust hood.

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).

BATH MAINTENANCE**Metallic additions**

For small-size ruthenium baths (up to 3 liters) we advise to use until the ruthenium solution is completely exhausted and dispose without incorporating replenishment. For larger-sized baths add **RU5R** which is a pre calibrated replenisher containing additional ruthenium in concentrate to restore the optimal ruthenium concentration. For perfect galvanic bath performance it is advisable to maintain the ruthenium concentration at a minimum of 20% of the initial concentration; for example, with a bath operating at a concentration of 5 g/l, additions should be made after a maximum consumption of 1 g/l of ruthenium. When introducing additional metal keep in mind that in optimum working conditions a bath working at 5 g/l normally deposits about 3 mg of ruthenium per Ampere/minute.

pH control

pH is a very important parameter especially when working on high thickness layers. The pH value must be frequently controlled and held under optimal values numerically described in the operating data table.

In the case corrections are needed use Ammonium hydroxide to raise the pH, and **RU5S** conductive salts to lower it.

Density control

Solution density is not a critical parameter. In the case of heavy productions, it is advised to control the density periodically by chemical titration. As the density lowers in value, restore to its optimum working health using **RU5S** conductive salts.

Adding 10 g/l of **RU5S** will raise the solution density of about 1° Bé.

**SAFETY INFORMATION**

Being an acidic solution, the electrolyte is corrosive therefore 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 cyanide based chemicals. For further information please refer to the relative MSDS.

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 or 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.