

RU5BLACK

RUTHENIUM READY TO USE PLATING BATH 5G/L BLACK-RIFLE BARREL COLOR

DESCRIPTION

RU5BLACK is a ruthenium plating electrolyte which deposits an abrasion resistant layer of ruthenium metal in a clean anthracite or rifle-barrel black color. The black color produced is developed with extremely stable organic additives making this electrolyte easy to use and maintain. This acidic based compound is primarily used in decorative plating applications for a diverse dark 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.

- Black color
- Very stable and easy to use process
- Abrasion and corrosion resistant
- 5 grams per liter
- Economical precious metal deposit

DEPOSIT DATA

Purity (%)	99.0
Hardness [HV 0.01]	600 - 800
Density [g/cm ³]	10.5
Thickness from-to [µm]	0.02 - 0.20
Aspect	Shiny
Color	Rifle barrel - black

PRODUCT FORM

Metal concentration	5 g Ru/l
Product pH	Acidic
Format	Ready to use liquid
Color of the product	Dark red
Storage time	2 years
Volume	1 L

RU5BLACK

RUTHENIUM READY TO USE PLATING BATH 5G/L BLACK-RIFLE BARREL COLOR

PRODUCT USAGE	RANGE	OPTIMAL
Voltage [V]	1.8 - 2.2	2.0
Current density [A/dm ²]	0.5 - 2.0	1.0
Working temperature [°C]	50 - 70	60
Treatment time [min]	1 - 6	4
Cathodic efficiency [mg/Amin]	1 - 5	3
pH	1.0 - 1.8	1.2
Anode/cathode ratio	1:1 - 4:1	2:1
Anode type	Ti/Pt	
Stirring	strong	

METAL CONCENTRATION		
METAL (g/l)	RANGE	OPTIMAL
Ru	3.0 - 5.0	5 g Ru/l

COLOR COORDINATES	
L *	55.0
a*	0.4
b*	2.0
C*	2.0

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	
RU5R.100ML*	Ruthenium sulfamate 5 g Ru/100ml - 100 ml
RU5S.1KG*	Conducting salts for ruthenium plating solution - 1 kg
RU5RB	Blackening additive for RU5BLACK - 1 L

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

USER GUIDE**READY TO USE SOLUTION PREPARATION**

RU5BLACK is a ready-to-use plating solution at the concentration of 5 g/l of ruthenium. 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.

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).

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

For small-size ruthenium baths (up to 5 liters) we advise to work until the ruthenium solution is completely exhausted without adding any replenisher solution. For larger -sized plating solutions add RU5R which is a pre calibrated replenisher containing ruthenium in concentrate form 5 g/100 ml to restore the optimal ruthenium concentration. For perfect plating solution performance, it is advisable to maintain the ruthenium concentration at a minimum of 80% of the initial concentration: for example, with a plating solution operating at a concentration of 5 g/l in Ru, 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.

The dark-black color of the deposit, on the other side, is maintained thanks to the frequent additions of the blackening solution: RU5RB. Basically, its restoring will be a function of both the plating solution workload and the type of dark shade desired by the operator. It is just an experienced operation: when the L* parameter starts to raise too much with respect to its tolerance, proceed with small portions addition of the related blackening agent solution. However, it is up to the operator's sensibility to understand how to properly dose the blackening agent solution into the plating solution, according to their own experience and working methodology. In general, better to not do additions higher than 3 ml/l at a time that often take to deposit problems.

RU5BLACK

RUTHENIUM READY TO USE PLATING BATH 5G/L BLACK-RIFLE BARREL COLOR

PRETREATMENTS

The plating solution RU5BLACK can be directly deposited on Gold, Palladium, Nickel and its alloys. For Silver, Copper and Copper alloys a flash of Pd will act in prevent copper migration to the external surface for the treated items.

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 rhodium 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 Pd plating solution for the platingtreatment.

POST TREATMENTS

The electrolyte should be removed from the surface as quick as possible. For optimum results follow this step: A) wash off the plating solution residues in a recovery rinse (static rinse); B) wash the treated items in hot deionized water (80°C): this will help in gain more brightness and luminosity; C) rinse the parts in circulating deionized water; D) dry. In the case a problem is observed, replace step B) with a rinse in concentrated ammonium hydroxide (ammonia) solutionfor 5 minutes. This action should be performed under an exhaust - hood.

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 using our high-grade purity WATER.

ABOUT pH

pH is a very important parameter. The pH value must be frequently controlled and held under optimal values reported on theoperating data Table. In the case corrections are needed, use Ammonium hydroxide to raise the pH, and RU 5S conductive salts to lower it.

ABOUT SOLUTION DENSITY

Solution density is not a critical parameter. In the case of heavy productions, it is advised to check the density periodically. As the density lowers in value, restore to its optimum working range by 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.