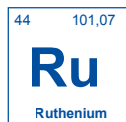


METAKEM
Precious metals & anodes

Ruthenium-BLACK-500

High Quality Ruthenium Electrolyte for
Decorative Black Coatings



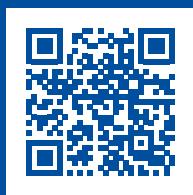


Precious metal baths

Ruthenium-BLACK-500

Operating Conditions

| | |
|-----------------------------|---|
| Ruthenium content: | 5 g / L (range: 2 - 8 g / L) |
| pH-value: | 1.0 - 1.5 |
| Working temperature: | 60°C (range: 60 - 75°C) |
| Voltage: | 9V (range: 2 - 9V) |
| Density: | 1.15 g / cm ³ (range: 1.15 - 1.20 g / cm ³) |
| Current efficiency: | 3 mg / Amin (range: 2 - 4 mg / Amin) |
| Exposition time for 0.5 µm: | 30 sec (at 9V) |



Request product:

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2024/11 | Item number: 10.131-32, 10.136-37

Ruthenium-BLACK-500 is an acidic electrolyte for the deposition of decorative black ruthenium coatings. The coatings are very hard (about 800 HV), maintain brightness and show high corrosion resistance. The intensity of the black colour may easily be controlled by the concentration of the blackening additive **Ruthenium-BLACK-500-B**.

Process Sequence

Before electroplating with ruthenium bath, all residual grease, polishing powder and oxides have to be removed from the surface. We recommend to degrease in separate cleaning baths, first in a hot alkaline cleaner followed by electrolytic degreasing. After thorough rinsing with water, the parts should be pickled in diluted acid and again rinsed in water. A pre-coat of gold is recommended, before the parts are rinsed again and can finally be placed in the **Ruthenium-BLACK-500** process solution.

Material made of zinc, tin, lead, iron and special bronze, must be provided with a sufficiently thick and dense layer of copper or nickel prior to ruthenium plating.

After removal of **Ruthenium-BLACK-500** the plated material is immersed in a spare rinse in order to gain adhering electrolyte solution. Then it is to be rinsed in running water, subsequently immersed in a warm, diluted solution of sodium hydroxide (50 g / L NaOH) for 2 - 4 minutes in order to neutralize adhering electrolyte solution completely.

Intensive rinsing in running water should be the last process step before drying.

The spare rinse solution must not be added to the process solution because insoluble hydrolysis products precipitate.

Equipment

Tank: PP- or PE-tanks with exhaustion should be used

Filtration: Filtration pump for a continuous electrolyte movement; filtration of the electrolyte through polypropylene cartridges

Heating: Bath heaters in porcelain or glass with thermostatic control for the temperature range 60 - 75°C

Rectifier: Use rectifier with continuous regulation

Anodes: Platinum plated titanium mesh (anode / cathode surface ratio of 2:1). Ask for **METAKEM-anodes**, i.e. **METAKEM-beakerglass-anodes**.

Bath agitation: Bath agitation is necessary, an additional cathode agitation is recommended

Delivery Form and Bath Preparation

Ruthenium-BLACK-500 is delivered as a concentrate with 25 g Ru / L.

Bath Preparation

- ◆ The plating tank is thoroughly cleaned and filled with deionized water up to half of the total volume.
- ◆ Addition of the ruthenium concentrate is done with continuous stirring.
- ◆ Filling up to the total volume with deionized water.
- ◆ Heating up to the operating temperature of 60°C.

Process Maintenance

Replenishing of the ruthenium content to maintain the recommended concentration is effected by adding ruthenium concentrate, containing 25 g / L Ru and other components essential for plating.

Safety and Disposal

Ruthenium-BLACK-500 contains free acid and is classified as irritant. Before working with this electrolyte, take notice of the safety data sheet. This electrolyte contains substances seriously hazardous to water resources. It should not be discharged untreated into the public sewer system or natural water courses.

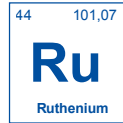
For the disposal of used electrolytes or drag-out rinse solutions containing precious metals, we recommend reprocessing by a refinery. Solutions free of ruthenium have to be detoxified in compliance with the local waste water treatment regulations.

**For further information
please contact us:**

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**Blackening Additive****Ruthenium-BLACK-500-B**

Ruthenium-BLACK-500-B easily controls the grade of blackening of Ruthenium-BLACK-500.

Operating Conditions

For the blackening of the ruthenium deposit, 2 – 6 ml **Ruthenium-BLACK-500-B** /g Ru are added to a new bath. The necessary amount depends on the desired intensity. In order to maintain the intensity of the black colour, a steady replenishment of about 4 ml **Ruthenium-BLACK-500-B** /g Ru is recommended during bath operation.

Due to the high working temperature (60°C), the **Ruthenium-BLACK-500-B** decomposes slowly even during working intermissions.

Before continuing, the intensity of the black colour has to be adjusted by replenishment of blackening additive.

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