

Technical data sheet and product guideline



RU5BLACK

Black ruthenium for bath plating 5 g/l ready-to-use

Color coordinates



| | |
|---|------------|
| L | 62 |
| a | 0.3 |
| b | 0.9 |
| c | 1 |

Product form

| | |
|---------------------|---------------------|
| Metal concentration | 5 g/l (Ru) |
| Form | Liquid |
| Material color | Black |
| Storage time | 2 years |
| Format | Ready to use |
| Chemical type | Acidic |
| Volume | 1 liter |

Operating data

| | Range | Optimal |
|--------------------------------------|----------------------------|--------------|
| Voltage (V) | 1.8-2.2 | 2 |
| Current density (A/dm ²) | 0.5-2 | 1 |
| Working temperature (°C) | 50-70 | 60 |
| Exposure time (sec) | 60-360 | 240 |
| pH | 1-1.8 | 1.2 |
| Cathode efficiency (mg/Amin) | 1-5 | 3 |
| Deposition speed (µm/min) | 0.009-0.028 | 0.019 |
| 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 |

Deposit data

| | |
|------------------------------|------------------|
| Purity (%) | 99.9 |
| Hardness (HV 0,01) | 600-800 |
| Density (g/cm ³) | 10.5 |
| Thickness (µm) | 0.02-0.20 |
| Appearance | Shiny |
| Color | Black |

Preparation

RU5BLACK is a ready-to-use galvanic bath at the concentration of 5 g/l. No preparation is required.

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Equipment

Working vessel: Pyrex glass / PVC / polypropylene.

Power supply: DC current rectifier with low residual AC (<5%).

Heating element.

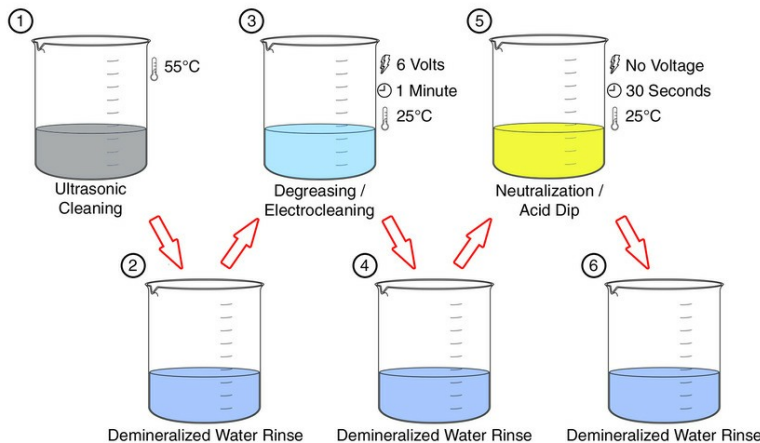
Anode Type Platinized Titanium [1.5-2.5 µm].

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 Cleansing procedure



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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 it's optimum working health using **RU5S** conductive salts. Adding 10 g/l of **RU5S** will raise the solution density of about 1° Bé.

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 preformed 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).

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.

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Disclaimer

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Packaging

