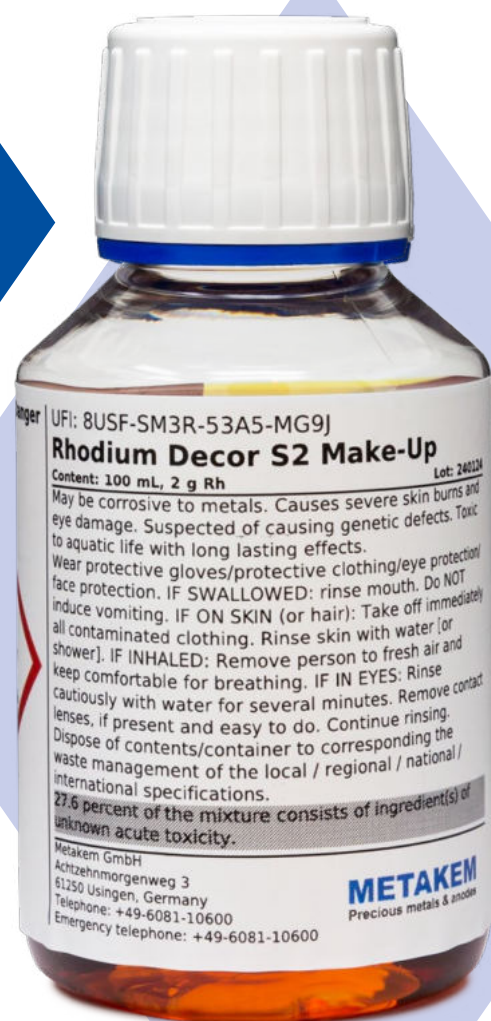


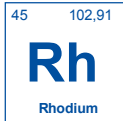
|           |        |
|-----------|--------|
| 45        | 102,91 |
| <b>Rh</b> |        |
| Rhodium   |        |

**METAKEM**  
Precious metals & anodes

# Rhodium-Decor-S2

High Quality Rhodium Electrolyte  
for Brilliant White Coatings





## Precious metal baths

## Rhodium-Decor-S2

## Electrolyte Characteristics

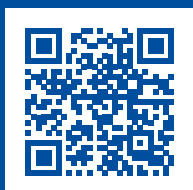
|                            |                                                        |
|----------------------------|--------------------------------------------------------|
| Rh content of make-up:     | 2 g Rh pro 100 ml                                      |
| Color of bath:             | red brown solution                                     |
| Rh content of electrolyte: | 2 g Rh / L                                             |
| pH-value:                  | <1                                                     |
| Operating temperature:     | 35°C (range: 25 – 50°C)                                |
| Current density:           | 1 A / dm <sup>2</sup> (0.5 - 2.5 A / dm <sup>2</sup> ) |
| Voltage:                   | 2 V (1.8 – 2.2 V)                                      |
| Deposition speed:          | 0.08 µm / min at 1 A / dm <sup>2</sup>                 |
| Deposition rate:           | 9.4 mg Rh / Amin at<br>1 A / dm <sup>2</sup> and 35°C  |
| Current efficiency:        | 32 % at 1 A / dm <sup>2</sup> and 35°C                 |
| Anode material:            | platinized titanium or MMO<br>titanium anode.          |
| Surface ratio:             | at least 1:1 (anode / cathode)                         |

## Coating Characteristics

|                     |                                                                                                  |
|---------------------|--------------------------------------------------------------------------------------------------|
| Coating:            | pure rhodium                                                                                     |
| Color:              | brilliant white,<br>>90 referring DIN 5033                                                       |
| Hardness:           | 800 – 900 HV                                                                                     |
| Density of coating: | ~12.4 g / cm <sup>3</sup>                                                                        |
| Coating thickness:  | max. 1.5 µm<br>(for decorative applications)<br>max. 3.0 µm<br>(for non-decorative applications) |

## Please note:

We reserve the right to improve the product at any time with regard to technical progress or product improvements at any time.



## Request product:

→ [metakem.de/en/request](https://metakem.de/en/request)

**Rhodium-Decor-S2** is a rhodium bath for decorative and functional applications which deposits brilliant white, very bright coatings. Suitable for rack and barrel plating.

The easy to operate electrolyte is characterized by an outstanding throwing power and high covering speed. Crack-free coating thicknesses up to 3.0 µm can be achieved.

Rhodium-Decor-S2 can be directly coated on silver, gold, nickel, nickel alloys, copper and copper alloys. If used for lead, zinc, tin, aluminium and iron, an intermediate nickel layer is essential and has to be applied before starting with the rhodium plating. The make-up can be finally used down to a Rh-content of 0.2 g Rh / L.

In case of replenishment Rhodium-Decor-S2-R has to be ideally added at a metal content of about 1.6 g / L.

## Form of Supply

The rhodium electrolyte is delivered in following package sizes:

**Rhodium-Decor-S2** (make-up concentrate):

100 ml acid-containing concentrate with 2 g Rh for 1 L of electrolyte with 2 g Rh.

**Rhodium-Decor-S2** (ready-to-use):

1000 ml ready-to-use bath with 2 g Rh.

**Rhodium-Decor-S2-R** (replenisher):

100 ml concentrate with 5 g Rh (does not contain free acid) to only replenish the used rhodium electrolyte.

**Rhodium-Decor-S2-Special Starter**

(additive after active carbon treatment):

1000 ml additive solution (contains no Rh).

Storage stability of all aforementioned products is at least 2 years – this refers to a storage in closed original storage containers under the conditions stated on the label.

## Necessary Equipment

**Tank:** Preferably polypropylene tank.

**Heating system:** Temperature adjustable heaters coated with quartz, teflon or porcelain.

**Agitation equipment:** Recommended to remove residual hydrogen bubbles from plating surfaces.

**Anode:** Platinized-Ti (2.5 µm) or MMO-Ti anodes - ask for anodes made by METAKEM.

**Current source:** Rectifier infinitely variable with current display and ampere-hour meter; residual ripple <5 %.

**Exhaust system:** Required for large baths.

**Filter cartridges:** Must be boiled in 10 % sulphuric acid for ca. 3 hours before use.

## Bath Make-Up for 1 Liter Bath

100 ml Rhodium-Decor-S2 make-up concentrate with 2 g Rh are slowly stirred into 800 ml of deionized water and are filled up to 1 L with deionized water afterwards.

## Operating Conditions

**Rhodium content:** Starting with 2 g Rh / L and operated down to:

- ♦ 1.60 g Rh / L in case of replenishment
- ♦ 0.25 g Rh / L in case of final work out

**Sulphuric acid content:** 25 g / L after electrolyte make-up with 2 g Rh / L.

**pH-value:** <1, monitoring not essential.

**Operating temperature:** 35°C (range: 25° - 60°C). Please note that at a temperature of 25°C the deposition rate decreases to 2 / 3 compared to the deposition rate at 35°C, while at a temperature of 45°C the deposition rate increases to 4 / 3 compared to the one at 35°C.

**Bath/Part Agitation:** Parts and / or electrolyte should be sufficiently agitated in order to remove hydrogen bubbles from plating surface.

**Current density:** 1 A / dm<sup>2</sup> (0.5 - 2.5 A / dm<sup>2</sup>)

**Voltage:** 2 V (1.8 - 2.2 V)

**Deposition speed:** 0.08 µm / min at 1 A / dm<sup>2</sup>

**Deposition rate:** 9.4 mg Rh / Amin at 1 A / dm<sup>2</sup> and 35°C

**Current efficiency:** 32 % at 1 A / dm<sup>2</sup> and 35°C

**Anodes:** Platinized-Ti or MMO-Ti anodes. The surface ratio (anode/cathode) should be ≥1:1.

## Replenishment

At the latest after the consumption of 20 % (=0.4 g Rh / L), the rhodium bath has to be replenished with 8 ml (=0.4 g Rh) of **Rhodium-Decor-S2-R**.

0.4 g rhodium are approximately consumed after a current flow of about 55 Amin at a current efficiency of 32 % or also after a current flow of about 82 Amin at a current efficiency of 22 %.

Use only **Rhodium-Decor-S2-R** for replenishment.

## Control & Correction of Electrolyte Function

Keep the rhodium electrolyte clean. When not in use, take the anodes out of bath and cover the tank/beaker. When not in use for a longer period of time, store the electrolyte in a closed bottle. Filter turbid electrolytes.

Avoid metallic impurities (especially while coating copper containing silver alloys) and in particular the import of cyanide. In general avoid filtration by active carbon as electrolyte additives can be removed.

If a treatment with active carbon is necessary - in case of organic contamination for instance - add 2 g of active carbon / L of electrolyte in a separate tank, stir for 2 hours at 35°C and filter afterwards.

After active carbon treatment it is essential to add 20 ml of Rhodium-Decor-S2-Special Starter to 1 L of rhodium bath to replenish the withdrawn additives of the bath.

**Analytic control:** the monitoring of rhodium content and - if necessary - also of the sulphuric acid content is recommended.

The bath has to be replaced no later than after the consumption of 20 g of Rh / L (in other words: after several replenishments) or a strong increase of sulphuric acid (up to 100 g / L). The huge advantage of Rhodium-Decor-S2 is that it can be operated down to 0.4 g Rh / L (with decreasing current efficiency but with constantly high coating quality).

## Further Process Recommendations

**Fittings:** All plastic parts in contact with the bath, i.e. tank, rack insulation, barrels, pumps and hoses, shall be acidified in cold sulphuric acid (5 - 10%) ca. 24 hours before being used. Attention. Very important: before filtering, cartridges must boil in 10 % sulphuric acid for ca. 3 hours. They are subsequently placed into the pump and rinsed with water which is to be replaced several times.

**Pre-treatment:** Achieve the desired starting condition of the plating surface by acid cleaning, grinding and polishing. Degrease parts in an alkaline cleaning solution or in an ultrasonic bath. Rinse, then degrease electrolytically, then rinse under running water and finally with deionized water.

**Strike nickel plating:** Rhodium-Decor-S2 can be directly plated on silver, gold, copper and copper alloys as well as nickel and nickel alloys. For other metals use an intermediate nickel strike plating.

**Acid dip:** After degreasing or strike nickel plating, dip the workpiece in 5 % sulphuric acid at room temperature to avoid any drag-in into the rhodium electrolyte.

**Important:** The acid dip treatment should always be the last step before rhodium plating. Let the workpiece drip and put it under current into the rhodium electrolyte without rinsing before.

**Post-treatment:** Let residual bath solution drip.

Rinse in deionized water, then in running water, and once again in deionized – if possible - hot water. Dry immediately. Use the first recovery rinse water for topping up the rhodium electrolyte.

**Rhodium reclaim:** Please contact us for all matters concerning the recovery and reclaim of rhodium from used / old bath residues.

**For further information  
please contact us:**

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