

**JEWELRY  
PLATING**
**RH2FJ**
**WHITE RHODIUM FOR BATH PLATING 2 g/100 ml MAKE-UP**
**DESCRIPTION**

- For decorative applications
- Brilliant-white, very light coatings
- Up to 0.3 microns coating thickness
- For both rack and barrel plating

RH2FJ is an electrolyte intended for the deposition of brilliant-white, very light, bright coatings. It is particularly suitable for the rhodium plating of jewelry, watches, spectacle frames and other decorative purposes. The usual coating thickness is ranging from 0.02 up to 0.2 microns.

**DEPOSIT DATA**

Purity (%)	99.9
Hardness (HV 0,01)	800-900
Density (g/cm <sup>3</sup> )	12.4
Thickness (µm)	0.02-0.2
Appearance	Shiny
Color	White


**PRODUCT FORM**

Metal concentration	2 g/100 ml (Rh)
Form	Liquid
Material color	Dark red
Storage time	2 years
Volume	100 ml

**PRODUCT USAGE**

	<b>RANGE</b>	<b>OPTIMAL</b>
Voltage (V)	2 - 4	3
Current density (A/dm <sup>2</sup> )	0.5 - 2	1
Working temperature (°C)	20 - 40	35
Plating time (sec)	60 - 180	120
Cathode efficiency (mg/Amin)	0	3
Anode/cathode ratio	1:1-4:1	2:1
Anode type	Platonized titanium	Platonized titanium
Agitation	Recommended	Recommended

**METAL CONCENTRATION**

<b>METAL</b>	<b>RANGE (g/l)</b>	<b>OPTIMAL (g/l)</b>
Rh	2.0 – 1.6	2.0

**COLOR  
COORDINATES**

L	90.2
a	0.8
b	1.6

*On white surface. To be intended as purely indicative depending on shape and application process mainly.*

**CORRELATED PRODUCTS**

<b>RH2FJ</b>	Make-up 2 g/100 ml
<b>RH5RJ</b>	Replenisher 5 g/100 ml

**SOLUTION PREPARATION**

**RH2FJ** is a rhodium electrolytic make-up at a concentration of 2 g/100 ml suitable for the preparation of 1 liter ready-to-use solution by following the steps described here below:

- Fill half tank with DI water
- Add ALL the make-up **RH2FJ** into the tank
- Wash the bottle of rhodium with DI water and pour it into the tank
- Add further DI water until reach the final liter ready-to-use solution
- Stir all the solution for few seconds

Once the ready-to-use solution has been prepared, heat it to the optimum working temperature and start to plate.

**EQUIPMENT**

To get the best results with this plating solution it is advisable to work with an equipment provided of:

- Working tank/Becker made on Pyrex glass or PVC or Polypropylene (PP).
- Power supply: DC current rectifier with ripple (AC residual) < 5%.
- Heating elements made on Quartz, Porcelain or PTFE.
- Anodes made of Platinized Titanium (1.5 – 2.5 µm).
- Exhausted systems for fumes

And only for bigger plating solution:

- Magnetic driven filter pumps with 5-15 µm cartridges in PP that have to be previously boiled and washed with DI water for 3 hours at least to prevent any possible organic contamination.
- Amperminute counter.

**BATH MAINTENANCE**

Small-sized of Rh bath (until 5 liters) can be used until the rhodium solution is completely exhausted without adding any rhodium concentrate replenisher solution.

For larger volumes use **RH5RJ** replenisher solution to restore the optimal rhodium concentration.

For perfect electrolyte performance it is advisable to maintain the rhodium concentration at values not lower than 80% of the initial concentration: i.e. with a plating Rh solution made with **RH2FJ** working at 2 g/l, additions should be done after a consumption of not more than 0.4 g/l of Rh.

Keep always in mind that at optimum conditions a bath working at 2 g/l deposits about 3 mg of Rh per ampereminute at 1 A/dm<sup>2</sup> and at 35°C; so 0.4 g of Rh are consumed indicatively after 130 ampereminutes.

Given the cost of rhodium and to have a precise evaluation of the metal consumption it is always advisable to run periodic analytical checks of both Rh and free sulphuric acid content.

**ALWAYS USE **RH5RJ** REPLENISHER SOLUTION TO RESTORE THE RHODIUM CONTENT.**

For a longer life of the plating solution **avoid any possible metallic contaminants** in particular Silver (Ag), Copper (Cu) and Zinc (Zn).

**If the plating solution is contaminated by organic species we suggest to run a treatment with Active Carbon.**

In doing so add 2 g/l of Active Carbon in the plating solution in a separate tank, stir for 2 hours at operating temperature and than filter it.

**LIFETIME OF THE PLATING SOLUTION:** if replenisher is used to maintain the bath during time we suggest in any case to change it at the latest **after 10 turnovers** (which is equal to 20 g/l Rh added by **RH5RJ**), because with an increasing of sulphuric acid concentration (caused by replenishment) both current efficiency and deposition speed will dramatically drop.

In any case the bath has to be changed if the sulfuric acid content has increased to 55 ml/l.

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**PRE TREATMENT**

Preliminary degreasing should be done through a cycle of ultrasonic degreasing solution. Rinse with running water and then degrease electrolytically by the use of the suitable alkaline solution **SGR1**. Once finished rinse the items with DI water and then activate the surface of the same by dipping the items in **NEUT1** acidic solution for a couple of times subsequently at room temperature to be sure that no alkaline traces are dragged into the rhodium plating solution.

**POST TREATMENT**

Once the rhodium plating has been finished remove as soon as possible any trace of electrolyte from the treated surface. Wash off the bath residues in a recovery tank filled with static DI water and then follow by rinsing the items in the next circulating deionized water tank. If possible wash the item with hot water also. After washing proceed to dry the items IMMEDIATELY.

**WATER PURITY**

To prevent contamination of the bath during both its preparation and any subsequent replenishing operation use ALWAYS DI water with a conductivity of less than 3  $\mu\text{S}/\text{cm}$  (containing no traces of organic compounds, Chlorine, Silicon or Boron).

**SUPPLEMENTARY INFORMATION - HINTS**
**ABOUT THE AGITATION OF THE PLATING SOLUTION AND OF THE ITEMS WHILE PLATING**

Being Rh bath a strong acidic solution, hydrogen bubbles will adhere to the items and must be removed by agitating the solution, by moving the rack or by tapping or knocking on the rack. Otherwise darker stains on the parts may occur. In any case bath agitation by air is not suitable. The movement of the rack can be provided by a cathodic bar movement system at a speed of 5-10 cm/s.

**ABOUT pH AND FREE SULFURIC ACID CONCENTRATION**

pH is < 1 and no control is required for rhodium plating solution. Free sulfuric acid content raises with the use of the bath (by replenishment).

**ABOUT THE DENSITY OF THE PLATING SOLUTION**

Density raises with the use of the bath (by replenishment).

**ABOUT THE VOLTAGE**

Stay inside the range reported on the Operating Condition Table on page 1 if possible. If the surface of the items and thus the required current can not be calculated, work with a bath voltage applied which is just sufficient for the minimal evolution of hydrogen gaseous bubbles (see higher).

**ABOUT THE DEPOSITION SPEED**

The deposition speed is, as reference-guideline- of around 0,025 microns/minute while working at 35°C at 1 A/dm<sup>2</sup>.

**ABOUT THE INCREASED CURRENT DENSITY**

The plating of a flash at increased current density is advantageous in some case when you want to increase the throwing power or when you want to plate on silver or copper alloys in general. At this purpose a flash plating at a current 3-4 times higher than normal operating condition is applied at approximately 1 minute.

**SAFETY INFORMATION**
**AVOID ANY DRAG IN OF CYANIDES IN RHODIUM PLATING SOLUTION TO AVOID THE DEVELOPMENT OF HIGHLY TOXIC FUMES!**

Classification and designation are noted in the Material Safety Data Sheet (according to the European legislation). The safety instructions and the instructions for the environmental protection have to be followed in order to avoid hazards for people and environment. Please consider the explicit details in our Material Safety Data Sheets.

**RH2FJ****WHITE RHODIUM FOR BATH PLATING 2 g/100 ml MAKE-UP****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.*