

**RH2FW**

RHODIUM CONCENTRATE PLATING BATH 2G/100ML WHITE COLOR

**DESCRIPTION**

RH2FW is the concentrated version of the W-type white rhodium plating solution. This electrolyte is intended for the deposition of brilliant white, very light, bright coatings when diluted in 1 liter solution. The deposition speed is slower than other formulations allowing for accurate consumption control. This balanced deposit also makes it an ideal choice for larger or flat surface permitting complete surface coverage in low current densities areas. The rhodium plating solution prepared by RH2FW is efficient at room-low temperatures allowing minimal water evaporation. 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.

- For decorative applications
- Brilliant-white, very light coatings
- Up to 0.2 microns coating thickness
- For both rack and barrel plating

**DEPOSIT DATA**

Purity (%)	99.9
Hardness [HV 0.01]	800 - 900
Density [g/cm <sup>3</sup> ]	12.4
Thickness from-to [µm]	0,02 - 0,20
Aspect	Shiny
Color	White

**PRODUCT FORM**

Metal concentration	2 g Rh/100 ml
Product pH	Acidic
Format	Concentrated liquid
Color of the product	Dark orange - reddish
Storage time	2 years
Volume	100 ml

PRODUCT USAGE	RANGE	OPTIMAL
Voltage [V]	2 - 6	3
Current density [A/dm <sup>2</sup> ]	0.5 - 10	3
Working temperature [°C]	20 - 60	40 - 50
Treatment time [sec]	20 - 60	40
Cathodic efficiency [mg/Amin]	4 - 8	6
Anode/cathode ratio	1:1 - 4:1	2:1
Anode type	Ti/Pt	
Stirring	Moderate	

METAL CONCENTRATION		
METAL	RANGE	OPTIMAL
Rh	0.4 - 2.0	2 g Rh/100 ml

COLOR COORDINATES	
L *	88.6
a*	0.6
b*	2.1
c*	2.2

**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 - INSTALLATION	
RH2FW.100ML*	Rhodium concentrate plating bath 2 g/100 ml white color - 100 ml

RELATED PRODUCTS - MAINTAINING	
RH5RW.100ML*	Rhodium W replenisher 5 g/100ml - 100ml
BRITENER1.1L	Brightener additive for rhodium - 1 L

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

**USER GUIDE****READY TO USE SOLUTION PREPARATION**

RH2FW 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 RH2FW 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.

**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 (generation of mists diffused by gaseous hydrogen development also can be irritant if inhaled or with allergenic effects .

**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).

**HEATING SYSTEM**

The admitted materials for heaters are: Pyrex, quartz or PTFE.

**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**

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 RH5RW 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 RH2FW 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 8-10 mg of Rh per ampereminute. 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 RH5RW REPLENISHER SOLUTION TO RESTORE THE RHODIUM CONTENT.

**ABOUT CONTAMINANTS**

For a longer life of the rhodium plating solution avoid any possible metallic contaminant particularly: Silver (Ag), Copper (Cu) and Zinc (Zn). If the plating solution will result contaminated by organic pollutants it is advisable to run an active carbon treatment. By adding 2 g/l of carbon into the plating solution to be purified. Then stir for 2 hours at a working temperature and filter it off. The important organic components withdrawn from the rhodium electrolyte after an active carbon treatment or even after several drag-out steps can be easily restored by addition of BRITENER1 replenisher (see related technical chart). In case it will be necessary to restore just the organic components (withdrawn from the rhodium electrolyte after an active carbon treatment or even after several drag-out steps) they can be easily restored by addition of BRITENER1 replenisher. BRITENER1 must be added in the rhodium plating solution only in these two cases:

- A. After filtration through active carbon
- B. After our technical service suggestion.

**PRETREATMENTS**

The ready to use solution obtained with RH2FW can be directly deposited on Gold, Silver, Palladium, and palladium alloys. For all the other metals (i.e. Copper and its alloys) it is necessary to make an intermediate deposit (strike) of precious metal especially to prevent any contamination for the plating solution from other metallic species like i.e. copper and zinc. All base metals that can suffer passivation over time must be reactivated before the application of the ready to use solution obtained by RH2FW. 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 Rh plating solution for the platingtreatment.

**POST TREATMENTS**

The electrolyte should be removed from the surface as quick as possible. Wash off the bath residues in a recovery rinse (static rinse). Rinse the parts in circulating deionized water and dry. A possible last rinse in hot static water before dry can help in gain more brightness and luminosity.

**WATER PURITY**

To prevent contamination of the plating solution during both its preparation and any subsequent replenishing operations, use demineralized water with a conductivity of less than 3  $\mu$ S/cm (containing no traces of organic compounds, Chlorine, Silicon, or Boron). To achieve maximum deposit quality, we suggest to use our high-grade purity WATER.

**ITEMS AND PLATING SOLUTION MOVEMENT**

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**

pH is < 1 and no control is required for rhodium plating solution. Vice versa is recommended to check periodically the free acid content in ml or g per liter of ready-to-use Rh plating solution by knowing that its value tends to increase with the usage of the plating solution and time (by replenishment).

**ABOUT SOLUTION DENSITY**

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

**ABOUT THE APPLIED VOLTAGE**

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

**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 CURRENT DENSITY**

The plating of a flash deposit at increased current density is advantageous in some cases when you want to increase the throwing power or when you want to plate on silver or copper alloys in general, also especially onto hollow parts. At this purpose a flash plating at a current 3-4 times higher than normal operating current density is applied for approximately 1 minute (avoidance of passive layers, faster covering also in undercuts and recessions. The evolving hydrogen must be allowed to escape without hindrance).

**SAFETY INFORMATION**

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

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**

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