

RH1FRT

CONCENTRATE RHODIUM PLATING BATH 1G/100ML WHITE COLOR

DESCRIPTION

RH1FRT is the concentrated version of the white rhodium plating electrolyte able to work at 1 g/L. To prepare the ready-to-use product, simply pour the 100 ml bottle into 900 ml of pure deionized water. This white rhodium plating electrolyte is commonly used in larger rhodium installations due to the minimal components needed for maintenance. As it works at 1 g/L the cathodic efficiency of this rhodium plating solution (and consequently its deposition speed) is slower than the other classic formulations at 2 g/L thus allowing for a better consumption control. This balanced deposit also makes it an ideal choice for large or flat surfaces permitting complete surface coverage in low current density areas. RH1FRT is also efficient at room temperature allowing minimal water evaporation.

- Works at 1 g/l di Rh
- Easy to maintain white rhodium
- Efficient at room temperature
- Slow Rh consumption

DEPOSIT DATA

Purity (%)	99.9
Hardness [HV 0.01]	800 - 900
Density [g/cm ³]	12.4
Thickness from-to [μm]	0.02 - 0.20
Aspect	Shiny
Color	White

PRODUCT FORM

Metal concentration	1 g Rh/100 ml
Product pH	Acidic
Format	Concentrated liquid
Color of the product	Dark orange - reddish
Storage time	2 years
Volume	100 ml

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PRODUCT USAGE	RANGE	OPTIMAL
Voltage [V]	2 - 6	3
Current density [A/dm ²]	0.5 - 10	3
Working temperature [°C]	20 - 50	20 - 30
Treatment time [sec]	20 - 60	60
Cathodic efficiency [mg/Amin]	1.5- 3	2
Anode/cathode ratio	1:1 - 4:1	2:1
Anode type	Ti/Pt	
Stirring	Moderata	Moderate

METAL CONCENTRATION

METAL	RANGE	OPTIMAL
Rh/100 ml	0.4 – 1.0	1 g

COLOR COORDINATES

L *	89.4
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

RH1FRT.100ML*

Rhodium concentrates plating bath 1 g/100 ml white color - 100 ml

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

USER GUIDE**READY TO USE SOLUTION PREPARATION**

RH1FRT is a rhodium electrolytic make-up at a concentration of 1 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 RH1FRT 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 (if necessary) 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 plating solution obtained with RH1FRT (until 5 liters) can be used until the rhodium solution is completely exhausted without adding any rhodium concentrate replenisher solution. For larger volumes add RH10S replenisher solution to restore the optimal rhodium concentration together with BRIGHTRT concentrate brightener solution in the amount of 10 ml per every single gram of Rh to restore. BRIGHTRT restores the important organic components withdrawn from the rhodium electrolyte obtained by RH1FRT make-up not only after several drag-out steps but also after an active carbon treatment. For perfect electrolyte performance it is advisable to maintain the rhodium concentration at values not lower than 80% of the initial concentration: for example, with a bath operating at a concentration of 1 g/l, additions should be done after a consumption of not more than 0.2 g/l of rhodium. Keep in mind that at optimum conditions a bath working at 1 g/l deposits about 1.5-3 mg of Rh per ampere-minute. Given the cost of rhodium and to have a precise evaluation of the metal consumption it is advisable to perform periodic analytical checks.

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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 $\mu\text{S}/\text{cm}$ (containing no traces of organic compounds, Chlorine, Silicon, or Boron). To achieve maximum deposit quality, we suggest to use our high -grade purity WATER.

PRETREATMENTS

The ready to use solution obtained with RH1FRT 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 ie. 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 RH1FRT. 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 plating treatment.

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 .

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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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