RH2FM

RHODIUM CONCENTRATE PLATING BATH 2G/250ML WHITE COLOR

DESCRIPTION

RH2FM is the concentrated version for the M type white rhodium plating solution. To prepare the ready-to-use product, simply pour the 250ml concentrated liquid into 750 ml of pure deionized water. The properties of the so obtained rhodium plating solution grant a higher degree of whiteness due to a more compact deposition when compared to standard rhodium solutions following the same process cycle. These results have been obtained by improving working conditions: the applicable voltage range has been widened, making the process parameters more flexible to guarantee optimal results. This new anti-burn technology eliminates the most common errors such as: surface calculation inaccuracy, prolonged immersion times, bath overheating and excessive voltage. It is also possible to obtain thicknesses which are higher than those generally obtained with a flash application. As consequence of the more brilliant deposition, the average consumption of the rhodium suspended in the electrolyte inclines to be around 10% higher under the same working conditions.

- Maximum process flexibility
- Superior white color
- Ideal for productions whitout object shape consistency
- Anti-burn technology

DEPOSIT DATA

Purity (%)	99.0
Hardness [HV 0.01]	800 - 900
Density [g/cm³]	12.4
Thickness from-to [µm]	0.02 - 0.50
Aspect	Shiny
Color	White

PRODUCT FORM

Metal concentration	2 g Rh/250 ml
Product pH	Acidic
Format	Concentrate liquid
Color of the product	Dark orange- reddish
Storage time	2 years
Volume	250 ml

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PRODUCT USAGE	RANGE	OPTIMAL
Voltage [V]	2 - 6	3 - 4.5
Current density [A/dm²]	0.5 - 10	3
Working temperature [°C]	20 - 60	40 - 60
Treatment time [sec]	15 - 120	30 - 50
Cathodic efficiency [mg/Amin]	4 - 12	8
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	2.0

COLOR COORDINATES

L *	90.5
a*	0.8
b*	1.4
c*	1.8

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

RH2FM.250ML*	Rhodium concentrate plating bath 2 g/250 ml white color - 250 ml

RELATED PRODUCTS - MAINTAINING

RH5RM.100ML*	Rhodium M replenisher 5 g/100ml - 100 ml
RH2RXL-C.100ML*	Correction replenisher for rhodium plating solution 2 g/100ml
BRITENER1.1L	Brightener additive for rhodium - 1 L

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

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USER GUIDE

READY TO USE SOLUTION PREPARATION

RH2FM is a rhodium electrolytic make-up at a concentration of 2 g/250 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 RH2FM 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.

SUPPLEMENTARY INFORMATION

Higher current density and voltage is advantageous in order to achieve the best brightness and luminosity in short plating time.

For excellent results with a very short plating time, we recommend the following operating data:

- VOLTAGE: 4V;
- TEMPERATURE: 60°C;
- PLATING TIME: 15 - 20 seconds.

TO INCREASE THICKNESS

An initial rhodium concentration of 2.5 g/l at least is recommended to get thickness higher than 0.4 microns.

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FOR ROTOBARREL APPLICATION

Recommended standard values are the following: apply a voltage within the range of 6-9 V in order to get a current density of 1 A/dm2 and at the temperature of 40°C. Deposition speed is approximately 0.03 µm/min but remember: this value is given as guide since the deposition speed strongly depends on the type and rotation of the barrel as well as shape and number of parts in the barrel.

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 RH5RM 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 rhodium solution as RH2M 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 RH5RM REPLENISHER SOLUTION TO RESTORE THE RHODIUM CONTENT.

CONTAMINANTS

If the plating solution results contaminated by organic pollutants it is advisable to run an active carbon treatment. Add 2g/l of carbon into the plating solution to be purified, stir for 2 hours at a working temperature and filter. The important organic components withdrawn from the electrolyte after carbon treatment or after drag-out steps can be easily restored by addition of 3 ml/l of RH2XL-C replenisher correction at a time. After any addition check the brightness of the deposition: in any case, do not do more than 4 subsequent additions.

In case it will be necessary to restore just the brightness compounds, they can be easily restored by addition of BRITENER1 replenisher by adding 2 ml/l at a time and with not more than 4 subsequent additions. BRITENER1 has also to be added in the rhodium plating solution in these two cases only:

A) after filtration through active carbon or

B) after our Technical Service suggestion.

For a longer life of the rhodium plating solution avoid any possible metallic contaminant particularly: Silver (Ag), Copper (Cu) and Zinc (Zn).

PRETREATMENTS

The ready to use solution RH2M 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 RH2M.

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.

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.

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WATER PURITY

To prevent contamination of the plating solution during any replenishing operations, use demineralized water with a conductivity of less than 3 µS/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/dm2.

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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