

Platinum plating bath PT/RH 12

Instructions for use

Edition 05/2021

Product description

Platinum plating bath PT/RH 12 deposits brilliant, white layers of platinum/ rhodium with high corrosion resistance and hardness and is highly suitable for decorative purposes. It produces extremely corrosion resistant surfaces of high hardness.

Layer properties

Coating:	Platinum/ Rhodium
Colour:	white
Max. layer thickness:	0.3 µm
Hardness:	ca. 600 HV
Density:	15.7 g/cm ³

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Platinum plating bath PT/RH 12, 1 l	(1.5 g Pt/l + 0.5 g Rh/l)	Art.-No. 81025301
Make-up concentrate PT/RH 12 A	(7.5 g Pt/l + 2.5 g Rh/l)	Art.-No. 81025302
Make-up concentrate PT/RH 12 A, 200 ml	(1.5 g Pt/200 ml + 0.5 g Rh/200 ml)	Art.-No. 81025303
Platinum concentrate PT/RH 12	(20 g Pt/l)	Art.-No. 81025304
Rhodium concentrate PT/RH 12	(20 g Rh/l)	Art.-No. 81025306
Regeneration solution PT/RH12 R	(18 g Pt/l + 2 g Rh/l)	Art.-No. 81025307
Additive N for PT/RH 12		Art.-No. 81025308

Equipment

Anode material:	MOX (Iridium- mixed oxide anode)
Anode/cathode ratio:	2:1 (anode/cathode surface size)
Heating:	heating element made of quartz glass or PTFE
Tank material:	PPH
Bath filtration:	required (permanent filtration with activated carbon)
Movement of cathode rod:	required
Exhauster:	recommended

Attention! Never use PVC as material for tanks or pumps

Bath make-up

Make-up chemicals

Bath chemicals for 1 l *Platinum plating bath PT/RH 12*:

- 200 ml Make-up concentrate PT/RH 12 A
- 800 ml Deionised water (< 10 µS)

Procedure

Into a thoroughly cleaned tank 80 % of the quantity of deionised water which is required for the desired bath volume is filled. Afterwards the appropriate quantity of *Make-up concentrate PT/RH 12* is **slowly** put into the water. The solution must be stirred until all make-up chemicals have fully mingled with each other. Then the solution is filled up to the desired bath volume with deionised water.

Process overview

Prerequisite for a strongly adhesive platinum/ rhodium plating is an intensive pre-treatment of the surface. This should be carried out using an ultrasonic cleaning bath made-up with *Ultrasonic cleaning concentrate ULTRA 3000*, *Electrolytic degreasing bath Type A* and finally an acid dip treatment in 10% sulphuric acid solution. Multistate rinsing is required after operation of each of the respective process baths. The last rinsing step before platinum/ rhodium plating should be performed in deionised water.

Normal agitation/ movement of goods is not sufficient in most cases because adhesive hydrogen bubbles are formed during rhodium plating that need to be removed. We therefore recommend agitation/ movement of goods using a beating device. For smaller bath volumes, it is usually sufficient to tap on the jig holding the goods.

Process parameters

Bath temperature:	40–50 °C
Exposition time:	2–3 min
Voltage:	1.5–2.5 V (suitable voltage for nominal current density depending on surface size to be plated, lower voltage for smaller surfaces, higher voltage for larger surfaces)
Current density:	2.0–4.0 A/dm ²
Deposition weight:	ca. 5 mg/min

The last rinsing after galvanic coating with *Platinum plating bath PT/RH 12* should be carried out in 60–80 °C hot deionised water for 10–20 s. This intensifies the colour of the deposition.

Bath control and regeneration

The bath control includes keeping the platinum/ rhodium contents at a constant level. Addition of Platinum concentrate PT/RH 12 and Rhodium concentrate PT/RH 12 raises the metal content in the plating bath. Not more than 10% of platinum/ rhodium should have been plated out of the bath prior to regeneration.

Per 1 g of deposited platinum/ rhodium the bath should normally receive for regeneration:

- 50 ml *Regeneration solution PT/RH 12 R*

For a larger bath volume we recommend regeneration according to ampere-minutes by using an ampere-minutes-counter.

Platinum/ rhodium deposition

By increasing the voltage or the temperature, more rhodium is being deposited. As a result, the whiteness of the layer increases.

Bath parameters

Platinum content:	1.5 g/l
Rhodium content:	0.5 g/l
pH-value:	< 1

On request we conduct regular analyses in our application technology laboratory and issue individual regeneration advices. For a standard analysis we require 100 ml of the electrolyte. In case of malfunctions or problems we require 1 l as probe.

Hazard information, storage, disposal

The plating bath contains sulphuric acid and must **not** come into contact with cyanides or cyanide-based solutions. The occupational safety measures and regulations specified in the material safety data sheet must be observed. The bath chemicals must be stored sealed and separately from food in suitable and labelled containers. Spent plating bath solutions and drag-out rinse waters must **not** be discharged into the waste water without first being treated. The spent plating bath solutions and drag-out rinse waters contain precious metals that we would be happy to recycle for you. Recovering such solutions can be profitable from 20 l.

The information on our product and the method are based on intensive research and technical experience of this application. We provide these results to the best of our knowledge and reserve the right to make technical changes in the course of product development. However, this does not relieve the user of their responsibility to check our specifications for their own use before application. If you have any questions or would like a consultation, please contact our application technology service department at any time. We would also be happy to discuss our further electroplating product range.