Rhodium plating bath WhiteStar® DIP+

Instructions for use

Edition 06/2020

Product description

Rhodium plating bath WhiteStar® DIP+ is utilised for galvanic deposition of rhodium and is characterised by its ultra-white high-shine rhodium layers and its outstanding throwing power. This bath is especially suited for filigree, geometrically demanding parts which should be furnished with high lustre. It produces extremely tarnish-resistant and active surfaces of high hardness.

Layer properties

Coating:	rhodium
Colour:	silver-white
Max. layer thickness:	1 µm
Hardness:	ca. 800–900 HV
Density:	12.5 g/cm³

Table of articles

Rhodium plating bath WhiteStar® DIP+	(2 g Rh/l)	**Art.-No.** 81016023
Rhodium plating bath WhiteStar® DIP+, 1 l	(2 g Rh/l)	**Art.-No.** 81020427
Rhodium concentrate WhiteStar® DIP+	(10 g Rh/l)	**Art.-No.** 81016021
Rhodium concentrate WhiteStar® DIP+, 200 ml	(2 g Rh/200 ml)	**Art.-No.** 81016022
Rhodium concentrate WhiteStar® DIP+, 20 g Rh/l	(20 g Rh/l)	**Art.-No.** 81018564
Regeneration concentrate WhiteStar® DIP+ R	(40 g Rh/l)	**Art.-No.** 81016108
Regeneration concentrate WhiteStar® DIP+ R, 100 ml	(4 g Rh/100 ml)	**Art.-No.** 81016109
Additive WS+ for WhiteStar® DIP+		**Art.-No.** 81016110
Additive N for WhiteStar® DIP+		**Art.-No.** 81016111

Equipment

Anode material:	platinised titanium
Anode/cathode surface:	2:1
Tank material:	PPH
Bath filtration:	required (**no** permanent filtration with activated carbon)
Agitation/movement of goods:	required
Exhauster:	recommended

Bath make-up

Make-up chemicals

Bath chemicals for 1 l *Rhodium plating bath WhiteStar® DIP+* (**2 g Rh/l**):

- 200 ml *Rhodium concentrate WhiteStar® DIP+*
- 800 ml Deionised water (< 10 µS)

Bath chemicals for 1 l *Rhodium plating bath WhiteStar® DIP+* (**4 g Rh/l**):

- 200 ml *Rhodium concentrate WhiteStar® DIP+, 20 g Rh/l*
- 800 ml Deionised water (< 10 µS)

Procedure

Into a carefully cleaned tank the quantity of deionised water which is required for the desired bath volume is filled. Now the appropriate quantity of *Rhodium concentrate WhiteStar® DIP+* or *Rhodium concentrate WhiteStar® DIP+, 20 g Rh/l* is slowly put into the water. The solution must be stirred until all make-up chemicals have fully mingled with each other.

Process overview

Prerequisite for a strongly adhesive 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*

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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 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:	20–40 °C
Exposition time:	2–3 min
Voltage:	2–4 V
Current density:	0,5–2 A/dm²
Deposition weight:	ca. 8 mg/Amin

The last rinsing after galvanic coating with *Rhodium plating bath WhiteStar® DIP+* should be carried out in 60–80 °C hot deionised water for 10–20 s. This intensifies the colour of the rhodium deposition.

Bath control and regeneration

The bath control includes keeping the rhodium content at a constant level. The rhodium content is raised by adding *Regeneration concentrate WhiteStar® DIP+ R*. When 20 % of the initial rhodium content have been plated out of the bath the rhodium content should be restored by the following measure.

Per 1 g of deposited rhodium the bath must receive for regeneration:

- 25 ml *Regeneration concentrate WhiteStar® DIP+ R*

Laboratory analysis can reveal that *Additive N for WhiteStar® DIP+* must be added in individual quantities. Here the following should be taken into consideration:
Prior to adding *Additive N for WhiteStar® DIP+* the additive must be heated to ca. 40 °C in order to dissolve all unsolved materials in it. Overdosing of *Additive N for WhiteStar® DIP+* must be avoided. Overdosing of *Additive N for WhiteStar® DIP+* results in heavy forming of foam inside the bath and dark rhodium depositions.

For a larger bath volume we recommend regeneration according to ampere-minutes.

Dark bath discolouring

Rhodium plating bath WhiteStar® DIP+ discolours automatically dark to black in the course of operation. This discolouring has no effect whatsoever to deposited layers and can be removed by an activated carbon treatment and subsequent addition of 2 ml/l *Additive WS+ for WhiteStar® DIP+* and 5 ml/l *Additive N for WhiteStar® DIP+*.
Prior to adding *Additive N for WhiteStar® DIP+* the additive must be heated to ca. 40 °C in order to dissolve all unsolved materials in it. Addition of *Additive WS+ for WhiteStar® DIP+* should not exceed 2 ml/l.

Pollution & removing overdosage of *Additive N for WhiteStar® DIP+*

Organic pollution and overdosages of *Additive N for WhiteStar® DIP+* can be removed by cleaning the bath with activated carbon. After the activated carbon treatment 2 ml/l *Additive WS+ for WhiteStar® DIP+* and 5 ml/l *Additive N for WhiteStar® DIP+* must be added to the bath.
Prior to adding *Additive N for WhiteStar® DIP+* the additive must be heated to ca. 40 °C in order to dissolve all unsolved materials in it. Addition of *Additive WS+ for WhiteStar® DIP+* should not exceed 2 ml/l.
Metallic pollution cannot be removed from the bath. In this case the complete bath must be replaced by a new one.

Bath parameters

Rhodium content:	2 g/l
pH-value:	< 1

On request we conduct regular analyses in our application technology laboratory and issue individual regeneration advices. For this service we require per each bath 1 l of it 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 sealed and stored 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 reprocess 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.

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