

Silver plating bath SCANDIA 360

Instructions for use

Edition 01/2020

Product description

Silver plating bath SCANDIA 360 guarantees an exceptionally high-shiny white fine silver deposit and excellent throwing power. It is best suited to galvanically coat decorative and technical products with silver. The electrolyte requires little maintenance and is very well suited to jig and barrel products. Pre-silver plating is not strictly necessary. For special applications such as pen plating or brush plating *Pen silver bath 360-S* is available.

Layer properties

Coating:	silver
Silver content:	99.5–99.9%
Colour:	bright white
Max. layer thickness:	> 100 µm (shiny deposition up to 10 µm)
Hardness:	100–110 HV
Density:	10.5 g/cm ³
Contact resistance:	5–10 mΩ at 10 cN tracking force

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Silver plating bath SCANDIA 360, 1 l	(36 g Ag/l)	Art. No. 81020429
Silver salt SCANDIA 360	(135 g Ag/kg)	Art. No. 86909100
Silver salt SCANDIA 360 without KCN	(270 g Ag/kg)	Art. No. 86909150
Silver salt SCANDIA 360 without KCN+without Ag		Art. No. 86909160
Brightener A for SCANDIA 360		Art. No. 86938810
Brightener A for SCANDIA 360 without KCN		Art. No. 81010650
Brightener A for SCANDIA 360, 10-times concentrate		Art. No. 86938811
Brightener B for SCANDIA 360		Art. No. 86938815
Brightener B for SCANDIA 360, 10-times concentrate		Art. No. 86938812
Silver replenishing salt N		Art. No. 86938820
Silver replenishing salt K		Art. No. 86938825
Potassium cyanide		Art. No. 86944570
Potassium silver cyanide 54% Ag	(540 g Ag/kg)	Art. No. 86900415

Equipment

Anode material:	fine silver in anode bag
Anode/cathode ratio:	1:1 (anode/cathode surface size)
Tank material:	PPH
Bath filtration:	required (for larger bath volumes)
Movement of cathode rod:	required
Exhauster:	required

Bath make-up

Make-up chemicals

Bath chemicals for 100 l *Silver plating bath SCANDIA 360*:

- 26,7 kg *Silver salt SCANDIA 360*
- 2,5 l *Brightener A for SCANDIA 360*
- 1,5 l *Brightener B for SCANDIA 360*
- 96 l Deionised water (< 10 µS)

or

- 13,7 kg *Silver salt SCANDIA 360 without KCN*
- 13 kg *Potassium cyanide*
- 2,5 l *Brightener A for SCANDIA 360*
- 1,5 l *Brightener B for SCANDIA 360*
- 96 l Deionised water (< 10 µS)

or

- 6,5 kg *Silver salt SCANDIA 360 without KCN+without Ag*
- 6,7 kg *Potassium silver cyanide 54% Ag*
- 13 kg *Potassium cyanide*
- 2,5 l *Brightener A for SCANDIA 360*
- 1,5 l *Brightener B for SCANDIA 360*
- 96 l *Deionised water (< 10 µS)*

Procedure

Into a thoroughly cleaned tank 2/3 of the quantity of deionised water which is required for the desired bath volume are filled. Therein the salts required for make-up are slowly put while stirring constantly. The solution must be stirred until all salts have been dissolved completely. Then *Brightener A for SCANDIA 360* and *Brightener B for SCANDIA 360* are added, the solution is filled up with deionised water until the desired bath level has been reached. Finally the solution is stirred well and left alone. After a respite of approximately 10 hours the electrolyte is ready-to-use.

Optimum dilution of *Brightener A SCANDIA 360, 10-times concentrate*

For achieving optimum quality of *Brightener A for SCANDIA 360* when producing it from *Brightener A for SCANDIA 360, 10-times concentrate* the following steps need to be taken.

Prior to taking out the desired quantity of *Brightener A for SCANDIA 360, 10-times concentrate* the canister it has been delivered and stored in must be rolled over well. Otherwise the quantity to be taken out might not be homogeneous enough so that this quantity as well as else quantities to be taken out later might lose quality. After the rolling over the desired quantity of *Brightener A for SCANDIA 360, 10-times concentrate* can be taken out and used for make-up of ready-to-use *Brightener A for SCANDIA 360*.

Bath chemicals for 1 l *Brightener A for SCANDIA 360*:

- 100 ml *Brightener A for SCANDIA 360, 10-times concentrate*
- 50 g *Potassium cyanide* (for quicker effect)
- 900 ml *Deionised water (< 10 µS)*

By adding 50 g of *Potassium cyanide* per litre *Brightener A for SCANDIA 360* to be produced, the time it takes until the brightener becomes effective in the course of make-up and especially in the course of regeneration of *Silver plating bath SCANDIA 360* is reduced notably.

After the above stated optimum dilution of *Brightener A for SCANDIA 360, 10-times concentrate* has been completed the so-produced *Brightener A for SCANDIA 360* should be stored for at least 2–3 days prior to usage. For achieving optimum quality it should instead be rolled over constantly for 14 days prior to usage.

Afterwards the so-produced *Brightener A for SCANDIA 360* can be stored or used for make-up or regeneration of *Silver plating bath SCANDIA 360*. Prior to taking out parts of *Brightener A for SCANDIA 360* it is again important to always roll it over well first in order to avoid that the parts to be taken out as well as the remaining rest are homogeneous enough so that no quality is lost.

Optimum dilution of *Brightener B SCANDIA 360, 10-times concentrate*

Prior to taking out the desired quantity of *Brightener B for SCANDIA 360, 10-times concentrate* the canister it has been delivered and stored in must be rolled over well. Otherwise the quantity to be taken out might not be homogeneous enough so that this quantity as well as else quantities to be taken out later might lose quality. After the rolling over the desired quantity of *Brightener B for SCANDIA 360, 10-times concentrate* can be taken out and used for make-up of ready-to-use *Brightener B for SCANDIA 360*.

Bath chemicals for 1 l *Brightener B for SCANDIA 360*:

- 100 ml *Brightener B for SCANDIA 360, 10-times concentrate*
- 900 ml *Deionised water (< 10 µS)*

Afterwards the so-produced *Brightener B for SCANDIA 360* can be stored or used for make-up or regeneration of *Silver plating bath SCANDIA 360*. Prior to taking out parts of *Brightener B for SCANDIA 360* it is again important to always roll it over well first in order to avoid that the parts to be taken out as well as the remaining rest are homogeneous enough so that no quality is lost.

Process overview

Prerequisite for a strongly adhesive silver 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* and *Electrolytic degreasing bath Type A*. Multistate rinsing is required after operation of each of the respective process baths. The last rinsing step before silver plating should be performed in deionised water.

Surfaces made of copper or its alloys should be immersed in *Silver plating bath SCANDIA 360* while being charged up or pre-silver plated with *Pre-silver plating bath VS 60* first.

Surfaces made of iron, tin, zinc, lead and their alloys should be pre-copper plated with *Copper plating bath CU 540* first.

Surfaces made of stainless steel must be pre-plated with *Adhesive nickel plating bath 216 H* or *Pre-gold plating bath VG 204* first.

Surfaces made of silver, nickel and palladium can be silver plated directly.

Process parameters

Bath temperature:	18–25 °C
Exposition time for 1 µm:	ca. 2 min (at 1 A/dm ²)
Voltage:	0.5–1.2 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 plating drum:	0.1–0.5 A/dm ²
Current density jig/rack:	0.5–5.0 A/dm ²
Deposition weight:	ca. 65 mg/Amin

The last rinsing after galvanic coating with *Silver plating bath SCANDIA 360* should be carried out in 60–80 °C hot deionised water for 10–20 s. This intensifies the colour of the deposition.

To improve tarnish resistance of the silver layer it is recommended to use *Anti-tarnish bath CRF+* as post-treatment.

Bath control and regeneration

The bath control includes maintaining constant silver and cyanide contents.

Per 100 g of deposited silver the bath must receive for regeneration:

- 185 g *Potassium silver cyanide 54% Ag*

In case of a larger bath volume we recommend adding every 1000 Ah:

- ca. 750 ml *Brightener A for SCANDIA 360*
- ca. 500 ml *Brightener B for SCANDIA 360*

Bath parameters

Silver content:	34–38 g/l
Free potassium cyanide content:	120–140 g/l

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

Silver plating bath SCANDIA 360 is classified as highly toxic according to the German Hazardous Substances Ordinance (GefStoffV). It contains cyanides and must **not** be brought into contact with acids or acidic 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. They 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.