

riag Ag 816

Cyanide free semi-bright silver electrolyte

riag Ag 816 is an alkaline cyanide free silver electrolyte. It is suitable for either barrel or rack operations and can also be used for electronic applications.

Properties

- cyanide free silver process
- direct coating of non-ferrous metals possible
- bright, white-yellowish deposits
- very good layer thickness distribution
- very good ductility

Make up

riag Ag 816 Make up

riag Ag 816 Replenisher

Range

400 – 700 mL/L

50 – 100 mL/L

Optimum

500 – 600 mL/L

50 – 100 mL/L

While stirring mix **riag Ag 816 Make up** and **riag Ag 816 Replenisher** with cold deionised water. Adjust the pH to 9.2 with KOH 45%.

Pre-silver plating:

Copper, copper alloys and nickel do not have to be pre-silver plated prior to bright silver plating to ensure the adhesion of the bright silver deposit. Steel parts must be pre-copper plated, we recommend using the cyanide free copper process **riag Cu 385** in order to stay completely free of cyanide.

Post-treatment:

A brief dip in sulfuric acid 10% lightens the deposits and is therefore recommended

Operating conditions

Temperature:	Range: 15 – 25 °C Optimum: 20 °C
pH value:	Range: 9.0 – 9.6 Optimum: 9.2
pH value adjustment	To increase the pH use KOH 50 %, to lower it nitric acid 30 %
Current density:	Rack: 0.3 – 1 A/dm ² Barrel: 0.1 – 0.3 A/dm ²
Voltage:	The required rectifier voltage depends on various determinants, e.g. current density, concentration, temperature, type of electrode and electrode interval. Rack: approx. 4 V Barrel: approx. 8 V
Anode/Cathode ratio:	2 : 1
Anode material:	Pure silver anodes (999.7 fine- milled)
Rectifier:	Rectifiers have to be adjusted until residual ripple is less than 5 % within the total current density range.
Agitation:	Strong air movement required, movement of the cathode rod is helpful
Filtration:	Continuous filtration of the electrolyte with A-carbon filter cartridges (filter with 1 micron) has been proven for trouble-free operation in practice and should be provided in any case. Filtration should be continued during non-operational time to ensure a trouble-free and quick start of the operation.
Deposition rate:	Approx. 0.60 µm/min at 1 A/dm ² 95 % cathode power at all normal current densities
Tanks:	Polypropylene or plastic tanks
Cooling:	possibly required (PP, possibly stainless steel), if the temperature is excessively exceeded, decomposition of the electrolyte is possible
Attention:	All used electrolyte materials containing cyanide must be cyanide free by applying a suitable method, e.g. treatment with a sodium hypochlorite solution (2 %) for 24 hours followed by a good rinse
Maintenance:	Maintain pH value in the pH range, analyse silver content regularly, add riag Ag 816 Replenisher according to the special info

Electrolyte components / consumption values

riag Ag 816 Make up

The **riag Ag 816 Make up** is used for the electrolyte preparation and the silver replenishment. The shelf life of the additive since manufacturing is six months.

riag Ag 816 Make up contains 30 g/L silver and weak complexing agents.

riag Ag 816 Replenisher

Regular additions of **riag Ag 816 Replenisher** are necessary to prevent the silver from precipitating. **riag Ag 816 Replenisher** contains a weak complexing agent to keep the silver in solution. The shelf life of the additive since manufacturing is twelve months.

Dosage:

During operation of the electrolyte:

- Every Monday of the week while electrolyte is in operation 0.75 – 1.5 mL/L
- Every working day while electrolyte is in operation 0.5 – 1.0 mL/L

During idle time of the electrolyte:

- First day after first idle week of electrolyte 0.75 – 1.5 mL/L
- First day after a further idle week of electrolyte 0.5 – 1.0 mL/L

By ampere hours: 2.5 – 3.5 L/1000 Ah

After every addition of **riag Ag 816 Replenisher** it is necessary to control or adjust the pH as it drops slightly.

Precipitation characteristics

Composition:	approx.. 99.8 % Ag
Density of coating:	10.5 g/ cm ³ , (1.0 mg/cm ² = 1 micrometer)
Resistance to wear and tear:	Good (very fine structure)
Solderability:	Excellent
Specific resistivity	3.0 – 3.5 μΩ/cm

Waste water treatment

The wastewater must be treated according to the legal regulations before it enters the sewage system. The electrolyte contains silver and weak complexing agents. A static rinse after silver plating coupled with ion exchange for recycling of the silver is recommended.

Safety instructions

Please refer to the safety data sheet and the general instructions for handling chemicals. Chemicals must not be stored below 10 °C.

Liability

This instruction manual was compiled with reference to the state of the art and all current standards, and is based on the long-term knowledge and experience of riag. However, riag cannot monitor compliance with this instruction manual and the methods described herein at the customer/end-user's premises. Work carried out with riag products must be adapted accordingly to meet local conditions. In particular, riag cannot accept liability for damage, loss or cost incurred due to a failure to adhere to this instruction manual, improper application of the methods, unauthorised technical modifications, insufficient maintenance or the absence of maintenance in respect of the requisite technical hardware or equipment, or in the event of use by unqualified personnel. riag is not liable for damage or loss caused by riag or its employees except where intention or gross negligence can be proved. riag furthermore reserves the right to make changes in relation to products, methods and the instruction manual without prior notice.

Our goods and services are subject to the General Terms and Conditions for Delivery of the Association of Surface Technology Suppliers (VLO), which can be viewed at www.riag.ch (link "terms and conditions" , document "General Terms and Conditions for Delivery", version 3/2018), which we gladly send you on request.

This transaction is governed by material Swiss law (Law of Obligations), excluding private international law (conflict of laws) and intergovernmental treaties, specifically the CISG.

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