

# RIAG Ag 810

## Bright to semi-bright technical silver plating electrolyte

**RIAG Ag 810** is an alkaline-cyanide silver process involving. It is suitable for either barrel or rack operation and is recommended for applications involving electrical H.F. conductivity above 30 MHz.

### Make up

	Range	Optimum
Silver cyanide (AgCN)	20 – 50 g/L	44 g/L
Potassium cyanide (KCN)	110 – 140 g/L	125 g/L
Potassium carbonate (K <sub>2</sub> CO <sub>3</sub> )	10 – 20 g/L	15 g/L
<b>RIAG Ag 810 Make up</b>	5 – 10 mL/L	5 mL/L
<b>RIAG Ag 811 Tenside</b>	2 – 3 mL/L	2.5 mL/L

### Make up

Dissolve whilst stirring thoroughly the Potassium cyanide, Silver cyanide and Potassium carbonate in cold, deionised water. After filtration add **RIAG Ag 810 Make up** and **RIAG Ag 811 Tenside**.

### Deposit

Composition:	approx. 99.9 % Ag
Deposit density:	10.5 g/ cm <sup>3</sup> , (1.0 mg/cm <sup>2</sup> = 1 micron)
Hardness (stable):	70 – 100 HV 0.1 dependent on brightener level
Conductivity:	0.63 megaohm/cm
Internal stress:	approx. 2.5 kg/mm <sup>2</sup> tensile
Wear resistance:	Good (ultra-fine grain structure)
Solderability:	Excellent

The deposits produced are semi-bright to bright. They depend on the condition of the substrate and the concentration of the brightener.

## Pre-silver plating

Copper or copper alloy and nickel must be pre-silver plated in a pre-silver plating electrolyte prior to bright silver plating, to ensure the adhesion of the bright silver deposit.

Lead, tin, zinc, iron or steel objects must be brass- or copper plated prior to pre-silver plating.

## Operating Conditions

Temperature:	Range: 15 – 25 °C Optimum: 20 °C
Cathode current density:	rack: 1 – 2 A/dm <sup>2</sup> barrel: 0.3 – 0.7 A/dm <sup>2</sup>
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) preferably with woven polypropylene anode bags
Rectifier:	Rectifiers have to be adjusted until residual ripple is <b>less than 5 %</b> within the total current density range.
Agitation:	3 – 6 m/min cathode bar movement
Filtration:	Continuous filtration of the electrolyte by means of a filter system with PP filters cartridges (filter unit 5 µm has proved to be a trouble-free operation in practice and should be installed in any way). Do not use Kieselguhr!
Deposition rate:	Approx. 0.64 µm/min at 1 A/dm <sup>2</sup> (67 mg/A min) Efficiency about 100 %

## Equipment

We recommend using tanks of polypropylene or glass fibre-reinforced plastic material with PVC-lining. The electrolyte is heated by porcelain heating elements with temperature control device. An ampere minute meter is recommended to stipulate the regeneration intervals of the electrolyte.

## Consumption values

The consumption values of the additives can deviate according to the article- or plants specifications. The consumption values for 1'000 Ah are according to our experience:

<b>RIAG Ag 810 Replenisher</b>	0.28 L
<b>RIAG Ag 811 Tenside</b>	0.12 L

## Special Information

1. If maximum deposit brilliance is essential, sodium ions can replace 20 % or more of the potassium ions. Only use sulphur-free quality sodium salts.
2. For economical processing, it is possible to lower the silver content to approx. 18 g/L, especially in barrel processing involving severe drag-out losses. However, it is vital to maintain free potassium cyanide concentrations higher than 100 g/L.
3. In hi-speed spot plating, it is possible to increase the silver content to 60 or possibly 80 g/L. The free cyanide is lowered to approx. 30 g/L.
4. New solutions or conversions must be treated with activated carbon if satisfactory, uniform results are to be achieved. When filtering is constant, carbon treatment is not usually necessary since the **RIAG Ag 811 Tenside** will be removed. Carbon does not remove **RIAG Ag 810 Replenisher**, however.
5. **RIAG Ag 810** can be converted to **RIAG Ag 811** if more brightness and a harder deposit is needed.
6. If brightness is largely insufficient, this can be corrected by adding 5 mL/L **RIAG Ag 810 Replenisher** plus 0.5 mL/L **RIAG Ag 811 Tenside**.

## Attention

Addition of other chemicals which are not indicated in our Technical Data Sheet may cause disturbance of the operation and may have a negative influence on the electrolyte and the quality of the deposits.

## Waste water treatment / Environmental protection

The electrolyte contains cyanide and heavy metal. They are extremely dangerous for the environment. The waste water needs to be prepared according legal regulations before getting in the canalisation.

A static rinse after silver plating coupled with ion exchanger for recycling of the silver is recommended.

## Liability

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