



Eco-Silver Series (A Series of Cyanide-Free Silver- Plating Solutions)

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1. Introduction

(1) Eco-Silver series lineup

Product name	Purity	Ag concentration (g/L)	Current density range (A/dm ²)	Bath temperature (°C)	pH	Coating appearance	Hardness (HV)	Features	Plating method	Applications
Eco-Silver SB106T	AG: 99 Sb and Se free	10	0.2 to 0.8	30	5.7	Matte	100	Resistance to discoloration Thick plating suitability	Rack	Decorations Electronic parts
Eco-Silver SBRCT	AG: 99 Se free	10	0.2 to 1.5	30	5.7	Semi-glossy	120 to 150	Heat resistance	Rack Barrel	Electronic parts
Eco-Silver B36T	AG: 99 Sb and Se free	25	0.5 to 2.0	30	6.0	Glossy	150	Glossiness	Rack Barrel	Decorations
Eco-Silver SB56T	AG: 99 Sb and Se free	40	0.5 to 4.0	40	6.0	Semi-glossy	100 to 150	Workability (Current density range)	Rack Barrel Hoop	Electronic parts

*****Silver plates** are used as anodes, and "Cu" is used as the material for all appropriate cases**

Several types of plating solutions are available to suit your application
Anti-replacement and anti-discoloration agents are also available.
Please contact us for details



1. Introduction

(2) Additives in the Eco-Silver series

	Silver supplementation solution	Conductive solution	Brightener	Hardener	pH increaser
Eco-Silver SB106T	○	○	-	-	-
Eco-Silver SBRCT	○	○	-	○	-
Eco-Silver B36T	○	○	○	-	-
Eco-Silver SB56T	○	○	○	-	○
Remarks	Used when the silver concentration decreases	Used at all times	Used at all times	Used at all times	Used when the pH decreases



2. Features of the Eco-Silver Series

(1) Benefits of not using cyanide

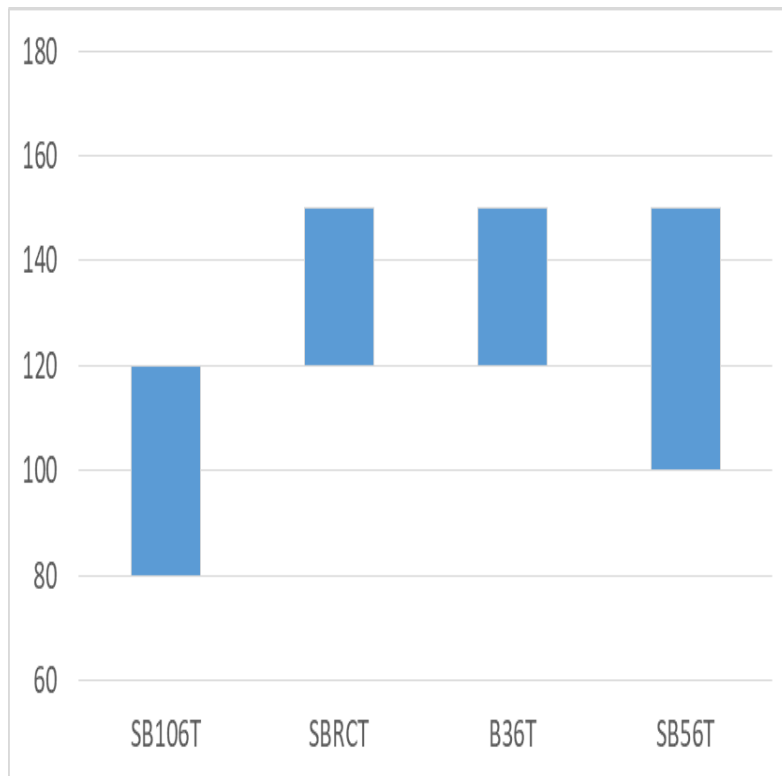
Item	Content
Exhaust gas	No need of cyanide gas washing towers (No cyanide gas is generated)
Wastewater treatment	No need for wastewater treatment facilities for cyanide decomposition
Safety	Contains no toxins such as cyan compounds, etc. No physical effects, such as cyanide toxicity, etc.
Liquid manageability	Complex management is unnecessary because there are no volatile substances such as free cyanide, etc. The Eco-Silver series has very high liquid stability



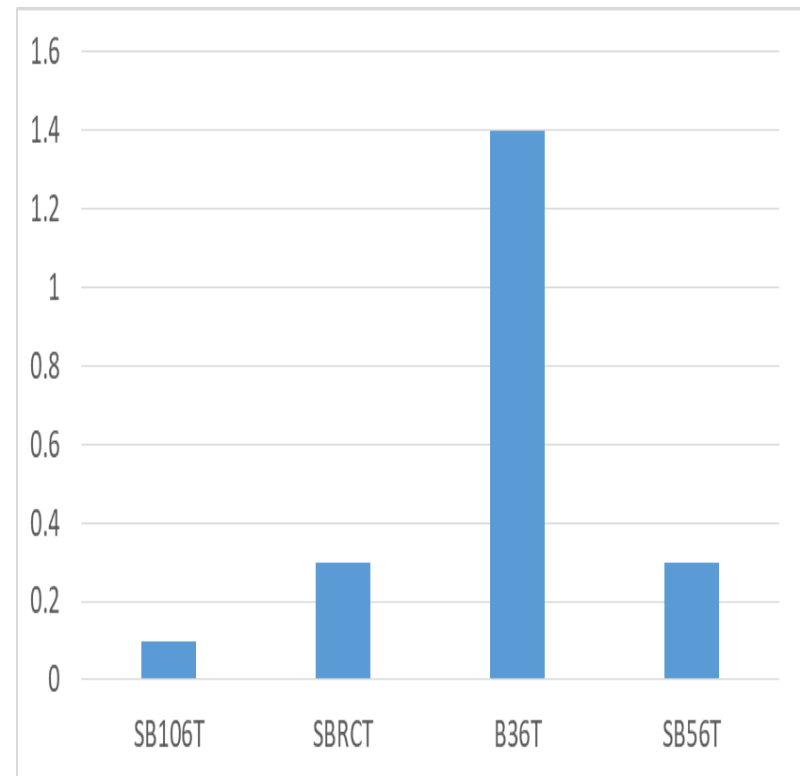
2. Features of the Eco-Silver Series

(2) Hardness and glossiness

Hardness



Glossiness





2. Features of the Eco-Silver Series

(3) Heat resistance

Plating conditions: Ag10 μm /Ni/Cu

Hardness and appearance after heat treatment at 150° C x 500 Hr

Plating solution	Hardness reduction	Discoloration
Eco-Silver SBRC	No	No
Hard cyan Ag coating (typical)	Yes	Yes
Hard cyan Ag coating (low Sb)	No	Yes

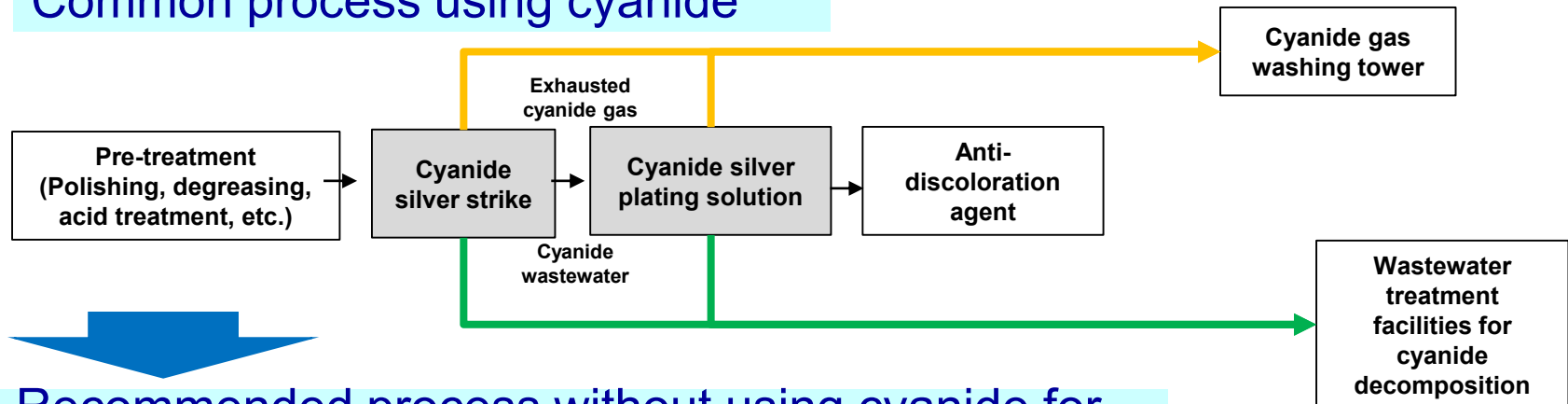
With the Eco-Silver SBRC, there was no discoloration nor a reduction in hardness even in an environment where it was exposed to high temperatures for a long time



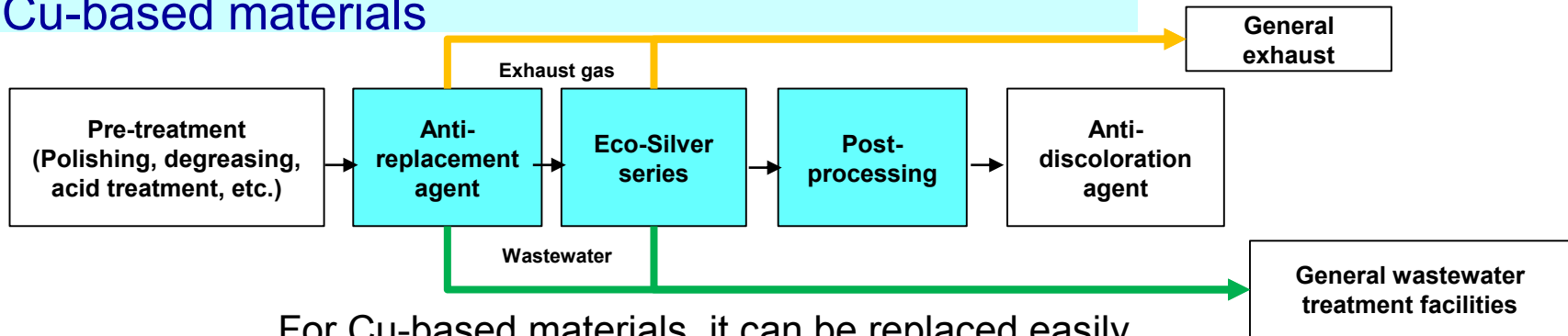
3. Example of Plating Process

Plating process (for Cu-based materials)

Common process using cyanide



Recommended process without using cyanide for Cu-based materials



For Cu-based materials, it can be replaced easily



4. Summary

Benefits to users

- Reduced stress on the environment
 - => The safety of workers is ensured
 - => Environmental pollution risks due to leakage of plating solutions are eliminated
- Coating hardness and heat resistance with the same or higher level than that of cyanide
 - => In particular, the heat resistance that the Eco-Silver series boasts during extended hours of processing is a property not found in cyanide baths
- The required hardness and appearance can be selected from the lineup
 - => A choice appearances which include "matte," "semi-glossy," and "glossy" are available