

CUPRALOR 100 *series*

HIGH EFFICIENCY ACID SHINY COPPER PLATING SOLUTION

Colour : **Red copper**

Use : **Bath**

Colour coordinates :

L : 85.1

a: 16.1

b: 6.2

Product description

CUPRALOR 100 is a line of shiny copper Galvanic acid processes specially designed for thick or flash deposits. CUPRALOR 100 processes are characterised by the notable compactness and resistance of their Galvanic layer, which make it particularly suitable for smoothing and polishing non-noble metal substrates.

Application field

CUPRALOR 101 can be deposited directly onto silver and brass. For metals consisting of tin, lead, zinc, and cadmium, a pre-treatment of alkaline cyanide copper is necessary. In the case of aluminium, zinc cementation or a similar process is required.

Operating conditions and deposit data

Parameter	UM	Operative range	optimum
Copper concentration	g/l	50 - 56	55
Sulphuric acid concentration	ml/l	30 - 40	35 (static use) 50 (barrel use)
Solution density	Bé°	15 - 18	17
Treatment time	Min	2 - 30	20
Temperature	°C	15 - 24	21
Voltage	V	2.0 - 6.0	4.0
Current	A/dm ²	3.0 - 8.0	5.0
Cathodic efficiency	mg/Amin	15 - 17	16
pH	Un	1.0 - 1.5	1.2
Copper deposited at 1000 A/min	g	15 - 17	16
Speed deposition (3A/dm ²)	u/min	0.4 - 1.2	0.6
Density of deposit	g/cm ³		8.9
Anodes			Copper phosphorous 0.02-0.06%
Anodes/Cathode rates		1:1 - 4:1	2:1
Agitation			Moderate/air
Filtration			Necessary over 5 litres

CUPRALOR 100 series

HIGH EFFICIENCY ACID SHINY COPPER PLATING SOLUTION

Colour : **Red copper**

Use : **Bath**

Colour coordinates :

L : 85.1

a: 16.1

b: 6.2

Adding information 1/4

Packaging

The product is bottled or canned in high-density polyethylene.

Equipment

For volumes up to 5 litres, it's best to use Pyrex glass containers, whereas for greater volumes it's recommended for one to install systems built with PTFE or PP and equipped with magnetic drive filter pumps with a 5-15 μ cartridge, as well as current rectifiers of the proper amperage. It is strongly recommended to use amp-minute metres to calculate consumption, as well as automatic dosing pumps for additives.

N.B. In order to avoid organic contamination, it's advisable to boil and wash the cartridge with demineralised water before its first use.

Preparation of the Galvanic bath

The Galvanic process is available in the ready-to-use version, or with additives. However, even in the ready-to-use version it's necessary to add 40 ml/L of pure sulphuric acid for analysis before use.

In the case of preparing a process of 100 litres with separate additives, proceed as follows:

1. Turn on the vacuum system and wear PPE
2. Fill the work tank with 60 litres of demineralised water
3. Dissolve in 22 Kg of copper sulphate pentahydrate
4. After this has dissolved, add 200 g of activated carbon powder for alimentary use, and wait 1 hour *(The solution is then filtered in the work tank and brought to 90 litres with demineralised water. Filtration must be done very carefully because the activated carbon particles in the electrolytes can result in an opaque copper deposit. If the filter is used for subsequent continuous filtration, it must first be thoroughly cleaned with the activated carbon)*
5. Once the filtration is complete, add 3.4 litres of pure concentrated sulphuric acid for the purpose of analysis (d= 1.84 g/cm³)
6. Add 1.0 litres of CUPRALOR 100CL
7. Add 2 litres of CUPRALOR 100AW
8. Add 0.2 litres of CUPRALOR 100HA
9. Add 0.2 litres of CUPRALOR 100HB

Demineralised water

In order to prevent the bath from becoming contaminated, both during the preparation thereof as well as during any top-ups, use demineralised water with a conductivity of less than 3 μ S/cm (without traces of organic compounds, silicon, and boron).

Anodes

Special elliptical anodes made of copper with a phosphorus content of 0.03 - 0.06 %; Copper phosphorus plates or anodes in the shape of small pieces of copper phosphorus contained in titanium crates. The anodes must be fitted with special bags made of synthetic materials resistant to acids. Appropriate anode bags made of synthetic materials applied to the crates or anodes may be used.

CUPRALOR 100 *series*

HIGH EFFICIENCY ACID SHINY COPPER PLATING SOLUTION

Colour : **Red copper**

Use : **Bath**

Colour coordinates :

L : 85.1

a: 16.1

b: 6.2

Adding information 2/4

Agitation of the solution and/or pieces

For work tanks with large volumes, it is recommended for the agitation of the solution to occur by means of a magnetic drive filter pump, while in the case of containers with lower volumes a moderate agitation of the pieces is sufficient. Air insufflation is required; The complementary use of the movement of the cathodic bar is advantageous for allowing a flow of air to reach all parts of the frame.

stroke length	beats/minute
100 mm	20 – 25
60 mm	25 – 30

The cathodic movement should preferably be horizontal.

The volume of air required is 12-20 m³/hr per meter of length of the bar cathode. The piping for the air inlet is placed parallel beneath the cathodic bar, about 30-80 mm from the bottom of the tank. Depending on the size of the tank, the piping is provided with holes with a diameter of about 3 mm positioned at intervals of 80-100 mm with a 45° angle with respect to the bottom of the tank. Each pipe has two rows of holes positioned opposite each other at intervals of 40-50 mm. It is recommended to install at least two agitation pipes (with an inner diameter of 20-40 mm) inside the tank. The distance between the pipes should be 150-250 mm. Recommended material: PVC or polyethylene.

Temperature

CUPRALOR 101 provides the best performance as temperatures between 15 and 26 °C. It is very important to keep the temperature between 18 to 26 degrees, as an excess of temperature results in very dull deposits, fast consumption, and degradation of the rinse acid. Temperature defects can result in high DDC burns.

Maintaining the solution (medium additions every 10,000 A/h)

3.5 litres (3.0—4.0) CUPRALOR 100HA

0.25 litres (0.2-0.6) CUPRALOR 100HB - with a stir bar and not insufflated air

If the ampere minutes are not known, add 0.1 ml/L if the brightening power decreases.

3.5 litres (3.0—4.0) CUPRALOR 100AW

In if insufflated air is used, the consumption of CUPRALOR 100AW will be about 3.0 litres

Consumption depends on the degree of brightness and levelling desired

simple to operate and does not require frequent analytical checks. The CUPRALOR 101 process is disposable, so therefore it is not managed with maintenance products.

In the event of:

- *dotted deposits*, add 3 cc/L of CUPRALOR 100AW up to a maximum of 6 cc/L
- *high DDC burns*, add 2 cc/L of CUPRALOR 100AW and 1 ml/L of concentrated sulfuric acid
- *widespread hazing*, on the entire deposit check that the temperature is not too high
- *excess CUPRALOR 100HA* , suspend additions.
- *low penetration*, can be traced back to low sulphuric acid, and a low concentration of copper sulphate, lack of CUPRALOR 100HA

CUPRALOR 100 *series*

HIGH EFFICIENCY ACID SHINY COPPER PLATING SOLUTION

Colour : **Red copper**

Use : **Bath**

Colour coordinates :

L : 85.1

a: 16.1

b: 6.2

Adding information 3/4

Effects of the additives

Copper Sulphate

The concentration must be maintained at 180 g/L for static use, or 150 g/L for use in a barrel. Excess doesn't involve any particular problems, while shortages result in poor penetration.

Sulphuric Acid

The concentration must be maintained at 35 ml/L for static tanks and 50 ml/L for barrel plating baths. A shortage may result in poor penetration and a lack of uniformity of the deposit.

CUPRALOR 100AW

This is the formative/surfactant additive and its ideal concentration is equal to 20 ml/L. An excess thereof may result in hazing at medium DDC while a lack thereof can cause burns at high DDC. The additions should be made in the order of 1 ml/L

CUPRALOR 100HA

This is the primary rinse acid of the process and its ideal concentration is equal to 1ml/L. An excess thereof may cause hazing at all DDC (very dark colour of the solution), while a shortage thereof may result in low levelling power and hazing at medium DDC. The additions should be made in the order of 0.1 ml/L

CUPRALOR 100HB

This is the secondary rinse acid of the process and its ideal concentration is equal to 0.5ml/L. An excess thereof causes hazing at high DDC, whereas a shortage is quite rare. The additions should be made in the order 0.05 ml/L

CUPRALOR 100CL

This is an additive that allows for the correct dissolution of the anodes during the process. A lack of this additive may cause "spider web" burns and a particular speckling. Additions of 3 cc/L solve the problem. It's very important to avoid an excess of this additive because the solution may be rendered unusable.

Notes

Instructions indicated in Our Process technical data sheets are the result of attentive checks and have been written as a guideline. They represent the best of our knowledge and refer to a normal use of our products. Such products are guaranteed in their quality up to the delivery: we cannot guarantee for the correct use of them, as this action is not under our direct control (addition or correction to plating baths are made by customer's personnel). As a consequence, process instructions have not to be intended as a guarantee of the final result in the use of our products.

Safety Information

Being an irritating solution, check carefully the related safety data sheet. (MSDS)

CUPRALOR 100 series

HIGH EFFICIENCY ACID SHINY COPPER PLATING SOLUTION

Colour : **Red copper**Use : **Bath**

Colour coordinates :

L : 85.1**a: 16.1****b: 6.2****Adding information 3/4****Related products**

Cod.Articles	Description	Colour	Packaging
RA020801	CUPRALOR 101 Copper plating solution	Red	1 litre
RA020810	CUPRALOR 101 Copper plating solution	Red	10 litres
RA010205	CUPRALOR 100AW starting additive		10 litres
RA020205	CUPRALOR 100HA primary additive		10 litres
RA020305	CUPRALOR 100HB secondary additive		10 litres
RA020405	CUPRALOR 100CL additive		10 litres