



# PRODUCT INFORMATION

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## MARTRON 314

**Martron 314** is a liquid additive for use in cyanide brass and copper plating baths to deposit a medium to full bright dense plate onto steel, cuprous alloys, zincate aluminum and zinc die casts. The process is eminently suitable for use as an undercoat on electronic components that are to be soldered, especially multi-metal assemblies.

Among the unique qualities of **Martron 314** are:

- **Martron 314** contains no metallic boosters.
- Both grain refiner and wetting agents in a single material.
- Easy to use and control.
- Deposits do not require alkaline cleaning before subsequent finishes.
- Dense deposits with fine grain minimize spotting and bleed out.
- Smoother deposits.
- Reduced drag out and chemical consumption.
- One product for both brass and copper.

**Martron 314** process copper deposits do not need alkaline cleaning prior to plating with nickel, brass, tin, silver, gold, tin-lead, etc. The uniform copper deposit is readily oxidized or antiqued, using **Martron 324**. The problem of "oxidized spots" due to metallic additives in the plating bath is eliminated.

**Martron 314** process baths can be air or mechanically agitated; it is a multi-component liquid formulated into a single addition agent, containing additives, brighteners, wetter's, etc. When used on zinc die casts, faults in the casings are minimized and covered over (bridged) in the bright nickel plating.

**Martron 314** plating baths have high efficiency, better coverage in recessed areas, high luster and good tolerance to metallic and organic contaminants.

### Section 1: USE

<u>Solution Composition</u>	<u>Range</u>	<u>Typical</u>
<b><i>Brass Plating</i></b>	oz./gal. (U.S.)	oz./gal. (U.S.)
Copper cyanide	4.0 – 9.0	5.0
Zinc Cyanide	0.8 – 2.0	1.0
Sodium Cyanide (total)	6.5 – 16.0	8.5
Free Sodium Cyanide	1.0 – 5.0	1.9
Sodium Carbonate	2.0 – 8.0	2.0
<b>Martron 314</b>	0.75 – 2% by vol.	1% by vol.
<b><i>Copper Plating</i></b>		
Copper Cyanide	6.0 – 12.0	9.0
Sodium Cyanide	11.0 – 15.5	12.2
Sodium Hydroxide	2.0 – 4.0	3.0
<b>Martron 314</b>	1.0 – 3.0%	2.0%
<b>Martron 324</b>	4.0 – 8.0%	6.0%

The following all potassium formulations will allow the use of higher current densities for faster and brighter deposits:  
For 1 oz/gal (7.5 g/l) of Copper Cyanide it takes 1.1 oz/gal (8.3 g/l) Sodium Cyanide to dissolve the above.

(Copper Cyanide x 1.1 = Sodium Cyanide needed.)

Copper Cyanide	8.0 – 12.0	9.0
Potassium Cyanide	14.1 – 20.5	15.9
Potassium Hydroxide	4.0 – 6.0	5.0
<b>Martron 314</b>	1.0 – 3.0%	2.0%
<b>Martron 324</b>	4.0 – 8.0%	6.0%

A mixed bath, using sodium cyanide and potassium hydroxide can also be used. Free cyanide content is usually applied to a particular set of circumstances and is determined by bath composition, operating temperature, degree of contamination, etc. Once the optimum range of free cyanide is determined for a particular bath, it should be maintained. As a guide for normal operation, a concentration of 2.2 to 2.5 oz./gal. is suggested.

The carbonate content of the bath should be kept to a minimum of 2.0 ounces per gallon and not allowed to remain over 10 to 12 oz./gal. The use of current manipulation (i.e. CI-current interruption or PR-periodic reverse) is useful in increasing the operating current densities for rapid deposition of the copper deposit.

**Section 2: OPERATION**

Cathode current density	5 – 40 amps/sq.ft.
Anode current density	10 – 20 amps/sq. ft.
Solution temperature	140 to 170°F.
Agitation	Air, cathode rod movement and/or solution circulation
Voltage	1 – 3 volts DC, across the tank bus bars
Tanks	Polypropylene or PVC lined steel tanks; unlined steel is a secondary choice
Filtration	Preferred, required when air agitation is used to avoid roughness
Anodes	High purity copper anodes, free of oxide occlusions
Anode Containers	For copper ball or other segmented types can be of steel
Anode Bags	(If needed) cotton or napped polypropylene
Ventilation	Exhaust necessary, for removal of steam and fumes

A copper strike prior to copper plate is generally required. See data under “Copper Strike” below. When the **Martron 314** bath is operated with air agitation, the air supply should be from a regenerative type blower (NOT air from a compressor) of sufficient size to provide air at a pressure of 1 pound per square inch for each 18 inches of solution depth and a capacity of one cubic foot per minute for each linear foot of immersed perforated (sparger) pipe. The low-pressure blower should, if at all possible and space is available, be mounted ABOVE the plating solution level to prevent any siphoning action.

If of necessity, the blower is mounted below the level of the plating solution, an anti-siphon device should be installed at solution level device is suggested to maintain solution level in the air agitated plating baths.

The rate of solution evaporation is markedly increased where air agitation is used. The replenishment of the bath from a static drag-out tank can significantly reduce the amount of cyanide and copper in the final water rinse effluent to be treated. With the use of air agitation, the generation of carbonate products will be greatly increased. A permanent method of removing them by reduced solution temperature precipitation should be seriously considered.

**Copper Strike (flash) Solution**

The use of a suitable copper strike is of prime importance in uniform semi to bright copper plating. If the copper strike deposit is too thin the copper plate may blister, if it is too thick or dull, the subsequent deposit may lack luster.

The composition of the copper strike solution, operating conditions, etc. should be selected so that a uniform semi bright deposit is obtained. The work should not be permitted to dry between the copper strike and the copper plate so as to avoid streaking, poor adhesion, etc.

It is recommended that the copper strike be equipped with a dam type overflow. The anodes need not be bagged and the solution should be free of brighteners other than the normal plating ingredients. The solution should be constantly filtered through a carbon packed filter with frequent renewal of the carbon pack. This procedure removes oils, wetter's, buffing compounds, etc. from being carried into the copper plating bath.

An excellent copper strike solution can be formulated as follows:

Copper cyanide	2-3 opg
Sodium cyanide	3-5 opg
Soda Ash	2-4 opg
<b>Martron 324</b>	4% by volume

The above formulation is ideal for zinc base die castings; for use solely on steel parts, sodium hydroxide is used instead of soda ash (sodium carbonate) in the above formulations.

The use of wetting agents in the copper strike is NOT suggested due to the fact that the solution can thus be ingested with unremoved buffing compound which tends to cause the formation of soaps in the strike bath. The drag over into the copper plating bath can cause undue foaming in air agitated copper plating system and cloudy deposits.

### Section 3: POST PLATE TREATMENT

If the copper finish is not to be over-plated, a passivation, oxidation, or lacquer finish is required to prevent undesirable oxidation. **Martron 314** may be used as passivation. **Martron Inc.** formulations may be used for antique oxidized finishes.

### Section 4: SAFE HANDLING

Cyanide copper and/or brass solutions are toxic, contain metals and cyanides that should be handled and operated with all the precautions indicated in the specific Safety Data Sheets for the chemicals. Wear proper protective gear with these and other chemicals. This safety gear should include but not be limited to chemical eye protection, impervious gloves, rubber apron, etc.

***Always read product Safety Data Sheet (SDS) before using or handling this or any other chemical product.***

### Section 5: WASTE TREATMENT

The product itself, **Martron 314**, generally does not require any special treatment. However, the cyanide copper bath in which it is used and the rinse water effluents thereof, contain metallic cyanides and caustic alkali. Treatment of the effluent is necessary to destroy the cyanide, remove the metal and adjust the final pH, in an approved treatment system.

Standard methods of approved waste treatment are satisfactory, as are many proprietary methods. Waste treatment and disposal of all liquids and solids are to be in accordance with all applicable Federal, State and Local regulations.

### Section 6: STORAGE

**Martron 314** should be stored in original closed container when not in use. Store in a cool, dry, well ventilated area and away from oxidizers and acids. Protect from freezing and from excessive heat. Rotate product inventory.

The data contained in this bulletin is believed by **Martron Inc.** to be true, accurate, and complete. Since, However, final methods of use of this product are in the hands of the customer and beyond our control, we cannot guarantee that the customer will obtain the results described in this bulletin, nor can we assume any responsibility for the use of this product by the customer in any process which may infringe the patents of third parties.