



PRODUCT INFORMATION

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EMERGENCY - MARTRON 704-289-1934
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MARTRON NI SATIN

- Martron NI-Satin** is an economical, high performance, neutral-satin nickel system that is specifically designed to provide excellent color, variable neutral brightness range, versatility and reliability.
- Martron NI-Satin** will impart uniform, ductile coatings, with low stress that will readily accept subsequent plated coatings.
- Martron NI-Satin** provides outstanding coverage and throw, even in solutions contaminated with metallic impurities.
- Martron NI-Satin** operates under most any operating conditions, such as standard or low concentration salts and/or temperatures and a wide variety of current densities, air or mechanical agitation.

Section 1: OPERATING PARAMETERS

	<u>Typical</u>	<u>Range</u>
Nickel (as metal)	10.0 oz/gal 75.0 g/l	7.0 -14.0 oz/gal 45.0 - 105.0 g/l
Nickel Chloride	4.0 oz/gal 30.0 g/l	3.0 - 6.0 oz/gal 22.0 - 45.0 g/l
Nickel Sulfate	38.0 oz/gal 285.0 g/l	15.0 - 50.0 oz/gal 112.0 - 375.0 g/l
Boric Acid	6.5 oz/gal 45.0 g/l 2.0 % by/vol	6.0 - 8.0 oz/gal 45.0 - 60.0 g/l 1.5-3.0 % by/vol
pH	3.5	3.2 – 3.8
Temperature	140°F 60°C	120° - 145°F 48° - 62°C
Current Density	10 - 80 ASF	25 ASF
Parts Loading	0.5 ft ² / gal	0.1 – 0.9 ft ² / gal
Agitation	Low Air, Cathode Rod or Solution Movement	
Filtration	Continuous 1 - 2 turnovers per hour	
Surface Tension	35-50 dynes/cm ²	

Section 2: FILTRATION

Continuous filtration is recommended in all plating baths. One to two turnovers per hour are recommended. Activated carbon, with a pre-coat of filter aid, should be added at 1 to 3 lbs. per 1,000 gallons of solution per week. Additional adds of carbon and filter aid can be made until the flow rate drops significantly at which time the filter should be cleaned and repacked.

Section 3: EQUIPMENT

Tanks	Rubber or plastic lined steel
Anode bags	Cotton, Dynel, or napped polypropylene
Heaters	Titanium or Teflon coated

Section 4: OPERATING NOTES

Optimum bath composition depends upon the requirements to the equipment available and the parts to be plated. Among these requirements are current density, type and finish of base metal, thickness required, part configuration, etc.

The appearance of **Martron NI-Satin** is largely dependent upon the condition of the base material and the degree of luster provided prior to the **Martron NI-Satin** bath.

Section 5: REPLENISHMENT

Under most conditions, **Martron NI-Satin-A** is the only material required for routine maintenance. The exact amount needed depends upon the appearance required, drag-out and temperature. Most installations should add:

1 gallon of Martron NI-Satin-A per 8,000-12,000 Amp Hrs.
(1 liter per 2100 – 3100 Amp Hrs.)

Automatic amp-hour feeders are recommended to reduce additive over-usage and to ensure uniform plating quality.

Section 6: DESCRIPTION OF COMPONENTS**Nickel Sulfate/Chloride**

Nickel Sulfate supplies most of the nickel ions to the solution while the chloride supplies the remainder. Low nickel sulfate will reduce cathode efficiency, necessitating longer plating times. High level of sulfate allows higher current. Nickel chloride improves bath conductivity and anode corrosion. Low concentrations may cause anode polarization. High concentrations can decrease deposit ductility, cause an undesirable increase in deposit brightness and leads to increased attack on equipment.

Boric Acid

Boric acid acts as a pH buffer for the solution. It prevents burning and pitting, helps to provide deposit ductility and maintains cathode efficiency. Low concentrations cause an increase in bath pH immediately adjacent to the cathode and the formation of metallic hydroxides from any metallic impurities present in the solution. These hydroxide compounds are included in the deposit, resulting in brittle and/or burned plate.

Martron NI-Satin-A

Used as a make-up and replenishment material. It is added to working solutions to maintain the individual addition agent components at their proper operating levels. It maintains uniform deposit appearance over a wide range of current densities. Low levels will produce a non-uniform deposit. Adding more **Martron NI-Satin-A** does not increase brightness; therefore, it is necessary to maintain proper additive levels.

Martron NI-WA 5

This low foaming surfactant is added as required to control hydrogen gas pitting. It can be used in mechanically or air agitated baths. It is not intended as a "purifier" to hide the effects of impurities, nor does it exhibit detergency properties and it will not emulsify oils and greases. Low concentrations result in pitting in higher current density areas. A moderately high concentration has no effect; however, an extreme excess can result in a cloudy deposit. **Martron NI-WA 5** is available in different formulations, depending upon your particular operating conditions.

Martron NI-Satin-B

This is a specially formulated liquid material, designed to eliminate low current density darkness, excess brightness and/or non-uniformity of the deposit. Small additions, 0.02%/volume, are effective in eliminating dark plate in the low current density areas or in eliminating two tone deposit.

Section 7: BATH pH

The **Martron NI-Satin** process plates with a 92-95% cathode efficiency and a 97-99% anode efficiency. Since the cathode efficiency is less than the anode efficiency, hydrogen ions are neutralized during production. These hydrogen ions are the source of acidity in the bath, thus, the pH of the bath tends to rise. The pH can be lowered with either sulfuric or hydrochloric acid. Use the reagent grade material wherever possible.

High pH results in increased deposit roughness, (because metallic impurities precipitate as hydroxides above 4.4), brittle deposits and reduced chrome receptivity (due to a tendency for organic films to remain on the surface of the deposit). High pH also contributes to a brighter deposit which may be undesirable. A pH on the lower end of the operating scale is typically recommended, as it will promote a more satin deposit.

Bath pH can be increased by either withholding acid additions until pH reaches proper level or nickel carbonate may be added. Additions of carbonate are very difficult to dissolve and should be made only if absolutely necessary. Additions should be made only through the filter to avoid extremely rough deposits. The amount of acid (or carbonate) required for routine maintenance should be relatively constant. If there is a change of acid (or carbonate) required, it's an indication that anode polarization is occurring. This can be due to low anode area or plugged anode bags.

Section 8: SAFE HANDLING INSTRUCTIONS

Proper handling information is labeled on all **Martron Inc.** products. All personnel using subject products should familiarize themselves with these instructions before use.

Section 9: WASTE DISPOSAL

Wastes must be tested using methods described in 40 CFR Part 261. It is the generator's responsibility to determine if the waste meets applicable definitions of hazardous wastes. Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

When empty, containers may still be hazardous because of product residue. All labeled hazard precautions must be observed.

Consult Safety Data Sheet (SDS) for additional safety and waste treatment information.

Section 10: NON-WARRANTY

The data contained in this bulletin is believed by **Martron Inc.** to be true, accurate and complete. However, since final methods of use for 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. **Martron Inc.** cannot assume any responsibility for the use of this product by the customer in any process, which may infringe the patents of third parties.