



PRODUCT INFORMATION

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MARTRON 420 CHROMATE

Hexavalent Chromium Conversion for Zinc and Cadmium Deposits

Section 1: DESCRIPTION

Martron 420 Chromate is a highly concentrated liquid chromate conversion coating specifically designed to produce a wide range of finished coatings from iridescent yellow, golden bronze to a leach clear finish. Properly applied, this coating will produce a chromate conversion coating that will withstand 96 - 120 hours neutral salt spray protection before the appearance of white corrosion products.

Martron 420 Chromate will function exceptionally well over a variety of zinc or cadmium plated substrates. The product will also provide an excellent base for paint and can be easily dyed by conventional dyeing techniques.

- Low concentration produces very high polished iridescent finish
- Offers outstanding operating life
- One component provides simple make up
- Coatings exhibit excellent wet film strength
- Ideal for operations where chromating is performed in a plating barrel
- Works equally well on rack or barrel processed parts

Section 2: SAFETY PRECAUTIONS

Always read and understand the Safety Data Sheet (SDS) for any chemical product prior to using the product to ensure familiarity with the methods of safe handling and health hazards associated with **Martron 420 Chromate**.

Section 3: MAKE UP and MAINTENANCE

Equipment

Tanks and any ancillary equipment should be constructed of plastic, polypropylene, PVC, 316 stainless steel or Koroseal lined steel.

If operating conditions are such that the temperature falls below 70 °F, heating and/or cooling coils of a material like the tank itself can be considered.

Agitation of the work or mild air agitation is recommended for rack work.

Ensure adequate ventilation is provided.

Solution Make Up

Iridescent Finish

	Optimum	Range
Martron 420 Chromate	1.5% (vol)	1-2% (vol)

Golden Finish

	Optimum	Range
Martron 420 Chromate	3% (vol)	2-4% (vol)

Bright/Clear Finish

Martron 420 Chromate can be made up at a higher concentration, and the yellow film leached to provide a clear chromate finish that exhibits the maximum degree of chemical polishing. In this instance, leaching should be done in a 3 oz/gal sodium carbonate solution.

	Optimum	Range
Martron 420 Chromate	13.5% (vol)	12-15% (vol)

Leach Solution

	Optimum	Range
Sodium Carbonate	3 oz/gal	2.5 – 3.5 oz/gal

Make Up Procedures

- Fill tank to ¾ of its working volume with warm water (80°F)
- With continuous stirring add the required amount of **Martron 420 Chromate**
- Add balance of water to fill tank
- Stir to mix uniformly
- Heat chromate solution to operating temperature
- Confirm solution composition by analysis

Operating Conditions

Chromate Solution

	Optimum	Range
Temperature	75°F	65 - 90°F
Immersion time		5 - 45 sec

Leach Solution

	Optimum	Range
Temperature	85°F	70 - 90°F
Immersion time	3 sec	1 - 5 sec

Typical Cycle

- Apply 2 – 3 tenths mil of zinc
- Overflowing water rinse
- Nitric Acid Dip (recommended but not always necessary)
- Overflowing water rinse
- Apply conversion coating **Martron 420 Chromate**
- Overflowing water rinse

If leaching chromate:

- Leach Solution

- Overflowing water rinse
- Rinse in hot running water (not to exceed 140 - 150 °F)
- Dry or subsequent post treatment may be applied at this time

Operating Notes

Chromate Solution

Martron 420 Chromate may be operated over a wide range of concentrations as described above. Lower concentrations will produce thinner, lighter colored films, while higher concentrations will produce heavier, thicker and darker colored films. If too high a concentration is utilized, the adhesion of the **Martron 420 Chromate** film to the plated work will suffer.

For a more uniform chromate film on rack work, agitation of the work or mild air agitation is recommended. A nitric acid pre-dip is recommended to extend the life of the working chromate solution.

When chromating zinc die castings, a 2% by volume Sulfuric Acid Pre-Dip is recommended.

Temperature Range

Martron 420 Chromate is formulated to operate over a broad range of temperature: however. Best results are obtained if the operating solution is kept between 65 – 90 °F. If conditions are such that the solution may drift outside this temperature range, it may be necessary to make provisions to control the temperature with heating and/or cooling equipment. An example would be installing a heater in cold weather areas to ensure quick start-ups and the ability to maintain the proper operating temperature during winter months.

Higher temperatures accelerate the deposition rate of the chromate, while lower temperatures slow down the rate of film formation. The color of the film may be affected as well.

These conditions can be offset to a certain degree by either lengthening or shortening the dip time as the temperature situation dictates. Also, it is possible to partially compensate for changes in temperature by altering the concentration of the **Martron 420 Chromate** used.

Rinsing

Good flowing rinses are always recommended, and are a must for optimum results. A warm rinse is preferable whenever practical. Parts should be agitated, if possible, during rinsing. Also, air agitation in all rinse tanks is recommended since it will improve rinsing efficiency and upgrade quality.

The rinses after alkaline solutions, such as the plating bath or a leach dip, should have a good flow of fresh warm water to them, and are kept clean. The drag-in of alkali to the chromate solution will have a tendency to neutralize the acidity in the bath and shorten its useful life. Also, drag-out of alkali, if carried over into the final rinse, will have an adverse effect on the corrosion protection provided by the chromate finish.

Rinsing after chromating should be thorough so that the soluble chromate solution is flushed off the parts, and out of pockets, seams, etc. Failure to rinse properly can cause streaking of the finished surface, as well as reduce the corrosion protection afforded by the chromate. The final hot rinse should not exceed 140 – 150 °F to prevent a dulling of the finish. The final hot rinse must be kept clean, and the immersion time in it should be no longer than necessary to give a quick, last rinse to the surface.

Finally, do not use common rinses after plating where the effluents from both cadmium and zinc plating solutions can mix causing immersion deposits on the work to be chromated resulting in serious detracting from quality.

Drying

The method of drying is critical. All chromate coating is soft when wet and should not be abraded. Drying is best done by means of a blast of warm air, or by a centrifugal dryer. Coatings dried by either of these methods will be slightly soft, but will age harden, reaching maximum hardness in approximately two days offering maximum resistance to corrosion.

Process Control

Solution maintenance is a function of drag out and soil contamination and varies by application. Solution concentration is determined by wet chemical analysis.

Analytical Method**Equipment Required**

- 2.0 ml pipet
- 250 ml Erlenmeyer flask
- 25 ml graduated cylinder
- 25 or 50 ml buret with stand

Reagents Required

- 10% Potassium Iodide solution
- Concentrated Hydrochloric Acid, reagent grade
- Starch Indicator solution
- 0.1 N Sodium Thiosulfate solution

Procedure

- Pipet a 2.0 ml sample of the chromate working solution into a 250 ml Erlenmeyer flask.
- Add approximately 100 mls of DI water.
- With a graduated cylinder, add 10 mls of 10% Potassium Iodide solution.
- With a graduated cylinder, add 10 mls of Conc. Hydrochloric Acid.
- Titrate with 0.1 N Sodium Thiosulfate solution until the brown color changes to pale straw/green clear color.
- With a graduated cylinder, add 1 – 2 mls of Starch Indicator solution.
- Continue titrating until the dark blue color disappears.
- Calculation:
(% vol) **Martron 420 Chromate** = mls of 0.1 N Na₂S₂O₃ x 0.62

pH Control

The pH of the chromate bath should be maintained in the range of 0.3 to 1.0. To lower the pH, the addition of 1 pint (16 fl.oz.) of nitric acid per 100 gallons of chromate solution will lower the pH by approximately 0.1 pH units.

Section 4: WASTE TREATMENT

Consult appropriate Federal, State, and local regulatory agencies to ascertain proper disposal procedures. Do not discharge into waterways or sewer systems. Disposal will depend on the nature of waste material.

Section 5: STORAGE

Avoid freezing **Martron 420 Chromate**. Store **Martron 420 Chromate** in an appropriate area with compatible materials. All chemicals should be stored in compliance with all applicable federal, state or local requirements.

Section 6: NON-WARRANTY and DISCLAIMER

The data contained in this bulletin is believed by **Martron Inc.** to be true, accurate and complete. Since the 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 any specific result. Accordingly, **Martron Inc.** does not assume any responsibility for the use of this product by the customer, the results obtained, nor the infringement of any patents of third parties.