



# PRODUCT INFORMATION

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## MARTRON JETBLACK 10 CHROMATE FOR ZINC

Silver Based, High Gloss, Jet Black Chromate on Zinc

### Martron Jetblack 10

chromate for zinc is a simple and efficient process for applying a single stage Black Chromate on zinc plate.

### Martron Jetblack 10 Martron Jetblack 10A: Martron Jetblack 10B:

chromate system consists of three liquid products:  
Make up and maintenance, activity adjuster.  
Added in a ratio of one gallon for each gallon of **Martron Jetblack 10A** for make up and two to one for maintenance.  
Used in the initial make-up only.

### Martron Jetblack Catalyst:

Used in the initial make-up only.

### Section 1: Equipment

The **Martron Jetblack 10** chromate process can only be installed in stainless steel, polyethylene, or PVC lined tanks. The use of mild steel tanks, lead liners, aluminum liners, lead or copper heating coils, is not recommended. Very mild agitation is important. Filtered, oil free air agitation that just rolls the solution is recommended.

### Section 2: Bath Preparation

The **Martron Jetblack 10** chromate process is prepared as follows:

1. Fill the tank 3/4 full of Deionized Water and heat to 85°F.
2. Add 7% of the tank volume of **Martron Jetblack Catalyst**.
3. Add with mixing 7% of the tank volume of **Martron Jetblack 10B**.
4. While mixing and with a temperature of 75°F minimum add slowly **Martron Jetblack 10A** at the rate of 7% of the tank volume. If 75°F minimum is not maintained during this step the new bath will produce a brown and dull finish and will require reheating to 140-150°F.
5. Adjust the pH of solution to the proper level by adding 1 1/3 oz/gal of chloride free caustic soda (Reagent Grade, Rayon Grade or HP DI Resin Grade). Do not use technical grade caustic soda for pH adjustments.
6. Adjust the solution volume and temperature to normal operating levels: 70 - 85°F. Maintain mild agitation during adjustments.

This solution will have an orange-brown, turbid appearance. This turbidity is normal and does not interfere with operation. Do not filter this solution. Disposal of the solution may be necessary only in cases of extreme contamination. Principal contaminants are chlorides, nitrates in very large quantities, lead, iron, copper, and most heavy metals.

A typical cycle for application of **Martron Jetblack 10** chromate would be:

1. Zinc Plate
2. Rinse
3. 1% Nitric Acid or 0.5% Sulfuric Acid (optional)
4. Rinse
5. **Martron Jetblack 10**
6. Cold Rinse (NOT over 90°F)
7. Dry

**Note:** If using Nitric Acid or Sulfuric Acid, rinsing prior to chromating is critical.

**Section 3: Operating Conditions**

	<u>Range</u>	<u>Optimum</u>
Activity*	3.0 – 6.0	4.0
Baume	5.0 – 15.0	9.0
Temperature	70 – 90° F	80°F
Dip Time	1 – 3 min	2 min
Ph	1.6 – 2.5	2.0

Agitation: Slight rolling air agitation. If bath has been idle for some time, agitate for 15- 30 minutes before using.

\* Activity is determined by Martron’s Standard Analytical Procedure as given of Page 3 of this bulletin.

**Section 4: Maintenance and Control**

During operation of **Martron Jetblack 10** chromate bath, the pH tends to increase and solution activity decreases.

Adjustments should be made daily before use. All additions should be made while agitating the solution.

To increase activity, add 1% of **Martron Jetblack 10A** for each 0.6 units of activity increase desired. For each 1% increase of **Martron Jetblack 10A**, add 2% of **Martron Jetblack 10B** in order to maintain a balanced solution.

To lower pH, add Sulfuric Acid in increments of one pint per 100 gallons of solution. pH value should be checked after each addition.

**Note:** The use of sulfuric acid should be kept to a minimum, even avoided if at all possible. It is used only when activity is acceptable and pH is still high.

**Section 5: Trouble Shooting**

The **Martron Jetblack 10** chromate finish can only be as good as the zinc plate. When the zinc plate is satisfactory, the black finish should be lustrous and free of iridescence. (Minimum suggested zinc thickness 0.0003 inches.) There are six variables that control the black finish:

Condition of the zinc plate, pH, concentration, temperature, time and contamination. The following Trouble Shooting chart offers suggestions for maintenance and operation of the **Martron Jetblack 10** Chromate Bath.

<u>If the finish is</u>	<u>Possible trouble</u>	<u>Remedy (Apply in order)</u>
Iridescent Black	1. Activity too low  2. pH too high 3. Temperature too high	1. Increase activity to 4.0. Always check activity prior to pH, <b>Martron Jetblack 10A</b> will automatically decrease pH 2. Adjust to 1.8 with Sulfuric Acid 3. Reduce temperature to 85°F
Olive Drab or Brown Finish and pH and Temperature are in range	1. Improper ratio of <b>Martron Jetblack 10B</b> 2. Activity too low 3. Dip time too short. 4. Contamination	1. A. Agitate for 10 minutes b. Add 1% of <b>Martron Jetblack 10A</b> 2. Increase activity to 4.0 3. Increase dip time to 2-3 min 4. Remove source of contamination (Chlorides)
Dull, stained or rough	1. Improper rinsing <b>before</b> Black Chromate	1. Increase rinsing

	2. Improper rinsing <b>after</b> Black Chromate	2. Increase rinsing or decrease rinsing
	3. Condition of zinc plate	3. Adjust zinc bath and/or Nitric or Sulfuric Acid bright dip
	4. Rinse after black chromate	4. Lower temperature to 85°F
	5. Nitrate contamination	5. Increase activity to high limit with <b>Martron Jetblack 10A</b> and increase rinsing if using Nitric Acid bright dip
	6. Solution too concentrated	6. Dilute 10% and then check activity
Plate is removed	1. Plate too thin	1. Plate thickness 0.3 mil. Required for new bath
	2. Temperature too low	2. Increase temp. To 75°F
	3. Activity too low	3. Increase activity to 4.0 – Check prior to pH
	4. pH too low	4. Increase pH to 1.8 with caustic soda

If a laboratory is available, the direction indicated above should be tried in the lab before alterations are made on the production bath.

### Section 6: Handling of Martron Jetblack 10 Chromate Chemicals

**Martron Jetblack 10A**, **Martron Jetblack 10B**, and **Martron Jetblack Catalyst** are highly acidic. Contact with any must be avoided. Protective gloves, face shield and apron should be worn when transferring these chemical products to the process tank. Avoid breathing of fumes or vapors of these products. **Martron Jetblack 10A** contains chromic acid, a powerful oxidizing agent. Do not allow **Martron Jetblack 10A** to come in contact with reducing agents such as Sodium Hydrosulfite, Sodium Bisulfite or organic compounds such as oils, greases or paper. Large spills of **Martron Jetblack 10A** will require hexavalent chrome reduction and neutralization prior to flushing to drain. Spills of **Martron Jetblack 10B** and **Martron Jetblack Catalyst** require neutralization prior to flushing to drain.

**!!!KEEP PRODUCT FROM FREEZING!!!**

### Section 7: Waste Disposal

Solutions of **Martron Jetblack 10** Chromate contain hexavalent chromium and are acidic. Therefore, the rinse waters and process solution require chromium reduction and precipitation and a pH adjustment to local ordinance standards. Informational bulletins on hexavalent chromium reduction are available on request from **Martron Inc.**

### Section 8: Analytical Methods of Control

#### Martron Jetblack 10A Concentration

##### Procedure

1. Pipette a 2 ml sample of chromate solution into a 250 ml Erlenmeyer flask.
2. Add 25 ml of a 1:1 Hydrochloric Acid, (1:1 Sulfuric Acid may be used), and 30 ml of distilled or deionized water.
3. Add 1 gram of Ammonium Bifluoride
4. Add 10 ml of a 10% Potassium Iodide Solution.
5. Titrate with 0.1N Sodium Thiosulfate ( $\text{Na}_2\text{S}_2\text{O}_3$ ) to a reddish-yellow color.
6. Add 2-5 ml of a 1% Starch indicator solution (solution will turn dark).
7. Continue to titrate with  $\text{Na}_2\text{S}_2\text{O}_3$  until a clear green end-point is reached.

**Calculation**

$$\begin{aligned} & (\text{ml titrated Na}_2\text{S}_2\text{O}_3) \times (\underline{N} \text{ Na}_2\text{S}_2\text{O}_3) \times 2.2 = \text{Martron Jetblack 10A activity} \\ & \text{Martron Jetblack 10A Activity} \times 1.75 = \% \text{ by Volume Martron Jetblack 10A} \end{aligned}$$

**Martron Jetblack Catalyst Concentration****Procedure**

1. Pipette a 2 ml sample of chromate solution into a 250 ml Erlenmeyer flask.
2. Add approximately 30 ml of DI Water.
3. Add 4 to 5 drops of Phenolphthalein indicator.
4. Titrate with 1.0N Sodium Hydroxide (NaOH) until the solution turns to a pink end-point.

**Calculation:**

$$(\text{ml titrated NaOH}) \times (\underline{N} \text{ NaOH}) \times 1.5 = \% \text{ by Volume Martron Jetblack Catalyst}$$

**Section 9: Non-Warranty**

The data contained in this bulletin is believed by **Martron Inc.** to be accurate, true and complete. Since however, final methods of use of these products 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.