



PRODUCT INFORMATION

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MARTRON CPA

Martron CPA process provides bright, strain-free chromium deposits over a wide range of operating conditions. It is specifically designed to operate at lower concentrations of chromic acid in order to obtain higher current efficiency and to minimize drag-out and waste disposal costs. Higher efficiency also offers higher plating speeds, thereby requiring less plating time for a given thickness than the conventional baths. Because of its powerful activating effect on nickel and stainless-steel surfaces, **Martron CPA Process** provides exceptional covering power of chromium over nickel and stainless-steel surfaces. Continued use of **Martron CPA** will normally maintain the concentration of the catalyst within optimum range. Sulfate can be determined by conventional methods and it should be maintained with sulfuric acid.

SECTION 1: COMPOSITION

		<u>Optimum</u>
Chromic acid	24 to 32 oz/gal (180 to 240 g/l)	28 oz/gal (210 g/l)
Sulfate	0.14 to 0.25 oz/gal (1.05 to 1.9 g/l)	0.20 oz/gal (1.5 g/l)
Ratio CrO ₃ to SO ₄	130:1 to 150:1	140:1

SECTION 2: MAKE-UP CONCENTRATION

Martron CPA	28 oz/gal (210 g/l)
66° Be. Sulfuric acid	0.20 oz/gal (1.5 g/l)

SECTION 3: SOLUTION PREPARATION

1. Clean the tank thoroughly and fill to about 2/3 of operating level with clean water. (If a new tank is used, the lining should first be flushed with water and then leached with 2 to 4% by volume sulfuric acid for 24 hours at 150°F. It should then be cleansed thoroughly with water again before use.)
2. Heat to 105 to 110°F.
3. Add **Martron CPA** slowly and with good agitation. Stir until completely dissolved. After the salts are completely dissolved, add 10.5 oz of 66° Be. Sulfuric acid per 100 gallons of solution and mix thoroughly.
4. Place clean anodes in the tank and fill to the operating level with clean water.
5. Stir at 105 to 110°F.
6. Using dummy cathodes, electrolyze the solution for 4 – 6 hours at 2 to 4 amperes per gallon of solution. The solution is now ready for use.

SECTION 4: EQUIPMENT

Tank:

Steel tank lined with Koroseal, ceramic tile or lead alloy.

Heating & Cooling coils:

Teflon tube bundles, lead alloys or tantalum.

Ventilation:

Ventilation used in conventional chrome plating is satisfactory.

Rectifiers:

For most decorative chromium plating installations, a 12 to 15-volt rectifier capable of providing smooth voltage regulation between 3 and 12 to 15 volts is satisfactory. Racks and bus bars should be capable of carrying currents up to 300 to 400 amperes per square foot of surface area to be plated.

SECTION 5: OPERATING CONDITIONS

Current density:

Average current density depends on the operating temperature, shape of the parts and of the auxiliary anodes, if used, and the racking arrangement. Bright deposits have been obtained between 40 and 400 ASF.

Temperature:

100 to 140°F. Optimum is 105°F. Automatic temperature control is recommended.

Agitation:

Very mild occasional air agitation using low pressure, oil free, clean air is all that is necessary to prevent temperature stratification. Vigorous agitation while plating may have undesirable effects on plate characteristics.

Anodes:

Lead-tin alloy anodes may be used.

SECTION 6: TYPICAL CLEANING CYCLE

1. Soak clean or Electro Clean 3 – 5 minutes in **Martron BH-PR**.
2. CWR – (cold water rinse) 30 seconds to 1 minute.
3. Acid pickle 1 – 3 minutes in **Martron 926 Acid Salts**.
4. CWR – (cold water rinse) 30 seconds to 1 minute.
5. Nickel plate or hard chrome plate.

SECTION 7: MAINTENANCE

Continued use of **Martron CPA** will normally maintain the concentrations of chromic acid and the catalyst within optimum range. It will also suppress spray and acid mist. All that is necessary is to check the concentration of chromic acid (hydrometer may be used for rapid check) to determine the amount of **Martron CPA** necessary to bring chromic acid and the catalyst to optimum level. Use Table I to convert hydrometer reading to chromic acid concentration.

NOTE: **Martron CPA** does not contain sulfate. Therefore, sulfate must be adjusted with sulfuric acid. Sulfate may be checked by conventional methods. Use Table II to determine the amount of sulfuric acid necessary to maintain the ratio at 140:1. For best results, frequent checks and adjustments are recommended.

CAUTION: Chromic acid is a powerful oxidizing agent. Avoid contact with combustible materials. Flush spilled salts or solution with plenty of water. Avoid contact with skin, eyes and clothes. Do not take internally. In case of eye contact, flush eyes with plenty of clean, cold water and get medical attention immediately. In case of contact with skin or clothes, flush exposed area with plenty of cold water immediately.

SECTION 8: WASTE DISPOSAL

Hexavalent chromium should first be reduced to trivalent with common reducing agents such as sodium bisulfite, ferrous sulfate or sulfur dioxide. The solution should then be neutralized to pH 7 with sodium hydroxide or carbonate (add slowly with agitation because the reaction generates heat. Pre-dissolve sodium hydroxide or carbonate in water before adding). Let settle in a lagoon or filter. Observe local waste disposal regulations.

TABLE I – DIRECT CONVERSION OF DEGREES BAUME TO OUNCES/GALLON OF CHROMIC ACID

Degrees Be	Oz/gal CrO ₃	Degrees Be	Oz/gal CrO ₃	Degrees Be	Oz/gal CrO ₃	Degrees Be	Oz/gal CrO ₃
14.00	20.4	18.50	28.1	23.00	36.0	27.50	45.0
14.50	21.2	19.00	29.0	23.50	37.1	28.00	46.0
15.00	22.0	19.50	29.8	24.00	38.2	28.50	47.1
15.50	22.9	20.00	30.6	24.50	39.1	29.00	48.2
16.00	23.7	20.50	31.5	25.00	40.0	29.50	49.2
16.50	24.5	21.00	32.4	25.50	40.9	30.00	50.2
17.00	25.4	21.50	33.3	26.00	41.9	30.50	51.5
17.50	26.3	22.00	34.2	26.50	42.9	31.00	52.7
18.00	27.2	22.50	35.1	27.00	44.0		

Degrees Baume to Specific Gravity $Sp\ Gr = \frac{145}{145 - ^\circ Be}$

Specific Gravity to Degrees Baume $^\circ Be = 145 - \frac{145}{Sp\ Gr}$

TABLE II – CONVERSION FROM OUNCES/GALLON TO TOTAL FLUID OUNCES OF SULFURIC ACID REQUIRED

TANK SIZE IN GALLONS
Fluid Ounces of 66° Baume Sulfuric Acid Required

Oz/gal H ₂ SO ₄ Be added	100	200	300	400	500	600	700	800	900	1000
0.01	0.5	1.0	1.6	2.1	2.6	3.1	3.7	4.2	4.7	5.2
0.02	1.0	2.1	3.1	4.2	5.2	6.3	7.3	8.4	9.4	10.4
0.03	1.6	3.1	4.7	6.3	7.8	9.6	10.9	12.5	14.1	15.7
0.04	2.1	4.2	6.3	8.4	10.4	12.5	14.6	16.7	18.8	20.9
0.05	2.6	5.2	7.8	10.4	13.0	15.6	18.2	20.9	23.5	26.1
0.06	3.1	6.3	9.6	12.5	15.6	18.8	21.9	25.0	28.2	31.3
0.07	3.7	7.3	10.9	14.6	18.2	21.9	25.6	29.2	32.9	36.5
0.08	4.2	8.4	12.5	16.7	20.9	25.0	29.2	33.4	37.6	41.8
0.09	4.7	9.4	14.1	18.8	23.5	28.2	32.9	37.6	42.3	47.0
0.10	5.2	10.4	15.7	20.9	26.1	31.3	36.5	41.8	47.0	52.2

1 fluid ounce = 29.57 cubic centimeters
1 fluid ounce of 66° Baume Sulfuric Acid weighs 0.12 pounds

The gallon referred to in above tables is U.S. Gallons.
1 U.S. Gallon = 3.785 liters or 3785 mls.
Oz. Per U.S. Gallon x 7.5 = grams per liter

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