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## SpectraMATE® 25

LIQUID CHROMATE  
TECHNICAL DATA  
01-26-10

### SpectraMATE® 25

#### A THICK-FILM TRIVALENT CONVERSION COATING FOR ZINC

- |                 |                                                                                                                                                                  |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SpectraMATE® 25 | is a high performance, thick-film trivalent conversion coating for electroplated zinc.                                                                           |
| SpectraMATE® 25 | produces a slightly iridescent, multicolor finish (hues of yellow, green, purple and pink) which is unique among high corrosion trivalent chromate processes     |
| SpectraMATE® 25 | provides a finish that <u>consistently exceeds 250 hours</u> of neutral salt spray to white corrosion products <i>without top coats</i> , when applied properly. |
| SpectraMATE® 25 | is an easy to use <u>one part system</u> that <i>does not</i> require multiple starter, adjuster, and replenisher type additives.                                |
| SpectraMATE® 25 | operates at a wider, and more user-friendly pH range (pH = 1.4 to 3.4) than conventional trivalent chromates.                                                    |
| SpectraMATE® 25 | is chelator-free, and does not rely on chelate ligand technology making it waste treatment friendly.                                                             |
| SpectraMATE® 25 | provides over 500 hours to white corrosion when top coated with Zinc-Chro-SHIELD® or Zinc-Chro-PELLENT™.                                                         |
| SpectraMATE® 25 | is ideal for both rack and barrel installations utilizing cyanide, alkaline cyanide-free or acid-chloride zinc plating electrolytes.                             |

## OPERATING INSTRUCTIONS

	<u>GENERAL APPLICATION</u>	<u>GMW 3044 APPLICATION</u>
Concentration:	8% to 10% by volume	8% to 10% (Optimum 9%)
Dip time:	45 to 120 seconds	50 to 70 seconds (Optimum 60 seconds)
Temperature:	50° to 110° F (10° to 42° C)	80° to 100° F
pH:	1.4 to 3.4	2.0 to 2.5 (Optimum 2.3)
Zinc deposit thickness:	Minimum 0.3 Mil (8 Microns)	8 to 16 Microns

NOTE: Dip times can vary depending upon the concentration and the age of the chromate.

## MAINTENANCE ADDITIONS

Periodic titrations should be made to ensure correct concentration. If the analysis shows the proper amount of SpectraMATE® 25 and the pH is high, small additions of 50% by volume of nitric acid can be made to adjust the pH.

## ANALYTICAL PROCEDURE

### TRITRATION PROCEDURE

#### Items Needed

1. DI Water
2. 20% Sodium Hydroxide Solution
3. 35% Hydrogen Peroxide Solution
4. 10% Nickel Chloride Solution
5. Conc. Hydrochloric Acid
6. Ammonium Bifluoride
7. 10% Potassium Iodide Solution
8. Starch Indicator Solution
9. 0.010N Sodium Thiosulfate Solution

#### Procedure

1. Pipette a 10 ml chromate sample into a 100 ml volumetric flask. Dilute to 100 ml with distilled water and mix well.
2. Pipette 10 ml of the above diluted solution into a 250 ml Erlenmeyer flask and dilute to 100 ml with distilled water.
3. Add 5 ml 20% Sodium Hydroxide and 1 ml 35% Hydrogen Peroxide.
4. Boil solution approximately 5 minutes.
5. Add 1 ml 10% Nickel Chloride Solution and continue boiling for an additional 2 minutes.
6. Cool solution to room temperature.

7. With mixing, add 10 ml Concentrated Hydrochloric Acid, 1 g Ammonium Bifluoride, 10 ml 10% Potassium Iodide and 2 ml Starch Indicator Solution.
8. Titrate the solution to a clear / green endpoint using 0.010 N Sodium Thiosulfate.

CALCULATION:

Percent SpectraMATE® 25 = ml 0.010 N Sodium Thiosulfate x 0.332

**TYPICAL CYCLE:**

- PLATE
- RINSE
- NITRIC ACID PREDIP (0.5% BY VOLUME)
- RINSE
- SpectraMATE® 25
- COLD WATER RINSE
- HOT WATER RINSE
- DRY

**IRON CONTAMINATION**

Iron contamination is a problem for all of the high-end/high performance trivalent passivation technologies. Iron can cause yellowing, staining, discoloration and reduced corrosion protection.

Extreme care should be used to keep iron from entering the working SpectraMATE® 25 chromate solution. The process tank should be cleaned at least once or twice per 8 hour shift to eliminate the potential for dissolving fallen parts. Adequate rinsing should always be maintained and nitric pre-dips prior to chromating should be dumped frequently to reduce drag-in of iron. Also, tubular parts should be allowed to completely drain before entering the chromate solution.

Coldip Tri-V Iron Control can be used as a treatment for iron contamination. Information is available in Coldip Tri-V Iron Control Technical Data Sheet. Ion Exchange Resin Filtration can also be used to remove iron. Contact a Columbia Chemical Technical Service Representative for further information.

**HELPFUL HINTS**

1. A Nitric Acid pre-dip is recommended to increase the life of the chromate particularly when an alkaline zinc electrolyte is utilized.
2. Although the pH for a new solution make-up may be below the recommended operating range of 1.4 to 3.4, parts can be processed since the pH will climb after only a few hours.
3. Sulfuric Acid or Nitric Acid can be used to adjust the pH down in a working SpectraMATE® 25 solution.

## HANDLING AND STORAGE

**CAUTION:** SpectraMATE® 25 is corrosive and contains chromium compounds and strong mineral acids. Contact with the skin or eyes should be carefully avoided. Protective clothing and eye shields or goggles should be worn when handling SpectraMATE® 25.

In case of contact, flush with large amounts of water. Remove contaminated clothing. For more detailed handling and storage instructions, please refer to the MSDS.

**FREEZABILITY:** As with most chemical products, it is preferable that freezing be avoided. However if freezing should occur during transportation or storage, directions for handling the products covered in this technical data sheet are as follows:

If SpectraMATE® 25 freezes, warm container to 95-105°F/35-41°C in a warm water bath. Thoroughly mix until precipitates are completely dissolved.

## NON-WARRANTY

The data contained in this bulletin is believed by Columbia Chemical Corp. to be accurate, true, 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 responsibility of the use of this product by the customer in any process which may infringe the patents of third parties.