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COLCAD 100

BRIGHTENER FOR CYANIDE CADMIUM PLATING TECHNICAL DATA

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COLCAD 100

LIQUID ADDITION AGENT FOR CYANIDE CADMIUM PLATING

- COLCAD 100 is a liquid addition agent for cyanide cadmium plating specifically designed to produce brilliant, extremely fine grained metal deposits over a wide current density range.
- COLCAD 100 significantly improves the throwing power and high current density covering power of the cadmium plating solution.
- COLCAD 100 will provide uniform brightness over a wide range of operating current densities and therefore is suitable for use in both rack and barrel plating applications.
- COLCAD 100 has a long operating life and provides for low cost bath operation.
- COLCAD 100 will operate over a wide range of bath compositions with outstanding throwing power and high current density brightness.
- COLCAD 100 readily accepts most conventional types of post treatments and chromate conversion coatings.

TYPICAL OPERATING CONDITIONS

	<u>RACK</u>	<u>BARREL</u>
Cadmium Metal:	2.0 - 4.5 opg. (15 - 34 g/l)	1.3 - 3.0 opg. (7.5 - 22.5 g/l)
Sodium Cyanide:	12 - 20 opg. (90 - 150 g/l)	10 - 18 opg. (75 - 135 g/l)
Caustic Soda:	1.2 - 2.5 opg. (9 - 19 g/l)	1.0 - 3.0 opg. (7.5 - 22.5 g/l)
Temperature:	70 - 95° F (21° - 35° C)	70 - 95° F (21° - 35° C)
Voltage:	3 - 6 volts	9 - 15 volts
COLCAD 100:	0.75 - 1.25% by vol.	0.75 - 1.25% by vol.

SOLUTION MAKEUP

BARREL PLATING:

	<u>100 Liters of Bath</u>	<u>100 Gallons of Bath</u>	<u>Yields</u>
Sodium Cyanide	13.2 kg	110 pounds	131 g/l (17.5 oz/gal)
Cadmium Oxide:	2.0 kg	17 pounds	18 g/l (2.4 oz/gal)*
Caustic Soda:	1.0 kg	8 pounds	22.5 g/l (3.0 oz/gal)
COLCAD 100	1 liter	1 gallon	

*As Cadmium Metal

RACK PLATING:

	<u>100 Liters of Bath</u>	<u>100 Gallons of Bath</u>	<u>Yields</u>
Sodium Cyanide	13.5 kg	112 pounds	134 g/l (17.9 oz/gal)
Cadmium Oxide:	2.4 kg	20 pounds	21 g/l (2.8 oz/gal)*
COLCAD 100	1 liter	1 gallon	

*As Cadmium Metal

NOTE: Caustic Soda is added to a barrel baths only to give maximum conductivity and to increase plating speed and output.

BRIGHTENER ADDITIONS

Replenishment of COLCAD 100 can be based on Sodium Cyanide. A typical addition rate would be 1 gallon COLCAD 100 for every 100 pounds (1 Liter per 12 Kilograms) of Sodium Cyanide added.

TROUBLESHOOTING

<u>PROBLEM</u>	<u>CAUSE</u>	<u>SOLUTION</u>
Poor Throw	High Cadmium Metal	Dilute bath, reduce anode area Maintain a cadmium level of 2.0 - 4.5 opg (15 - 34 g/l) for rack plating and 1.0 - 3.0 opg (7.5 - 22.5 g/l) for barrel plating.
HCD Burn/Overall Dull	Low Cadmium Metal	Increase anode area Maintain a cadmium level of 2.0 - 4.5 opg (15 - 34 g/l) for rack plating and 1.0 - 3.0 opg (7.5 - 22.5 g/l) for barrel plating.

<u>PROBLEM</u>	<u>CAUSE</u>	<u>SOLUTION</u>
LCD Haze	High Cyanide	Stop cyanide additions Maintain a cyanide concentration of 12 - 20 opg (90 - 150 g/l) for rack plating and 10 - 18 opg (75 - 135 g/l) for barrel plating.
LCD Dullness / Poor Throw Cadmium Metal Decreases	Low Cyanide	Increase cyanide concentration Maintain a cyanide concentration of 12 - 20 opg (90 - 150 g/l) for rack plating and 10 - 18 opg (75 - 135 g/l) for barrel plating.
LCD Dullness / Overall Dull	High Caustic	Stop caustic additives Maintain a caustic concentration of 1.2 - 2.5 opg (9 - 19 g/l) for rack plating and 3.0 opg (7.5 - 22.5 g/l) for barrel plating.
Anode Polarization / Cadmium Metal Decreases / Staining	Low Caustic	Maintain a caustic concentration of 1.2 - 2.5 opg (9 - 19 g/l) for rack plating and 1.0 - 3.0 opg (7.5 - 22.5 g/l) for barrel plating.
Overall Dullness / HCD Burning	Low Brightener	Add 0.25 - 1.0% by volume COLCAD 100
Blistering	Chromium Contamination	Treat bath with 0.25 lb. Sodium Bisulfate per 1,000 gallons. (30 g/1,000 liters) per 15 ppm of Chromium.
Black Deposit After Bright Dip	Copper Contamination	Treat bath with 1 lb. zinc dust per 1,000 gallons of bath (0.12 kg/1,000 liters) to remove 10 ppm of metallic contaminant /dummy plate.

ANALYSIS OF COLCAD 100 BATHS

Analysis for Cadmium Metal

1. Pipette 2.0 ml bath sample into a 250 ml Erlenmeyer flask and dilute to 100 ml with distilled water.
2. Add 20 ml ammonium hydroxide/ammonium chloride buffer solution.
3. Add approximately 0.2 gm Eriochrome Black T Indicator.
4. Add 20 ml 8% formaldehyde solution.
5. Titrate immediately with Standard 0.0575 M EDTA Solution to a blue endpoint

FACTOR: (ml Standard 0.0575 M EDTA Solution) x 0.432 = oz/gal Cadmium Metal.

Analysis for Caustic Soda

1. Pipette 5.0 ml bath sample into a 250 ml volumetric flask.
2. Add 5 ml of 20% Sodium Cyanide Solution and 1 to 2 ml Caustic Blue Indicator.
3. Titrate with Standard 0.94 N Sulfuric Acid Solution to a color change of yellow-green to blue.

FACTOR: ml Standard 0.94 N Sulfuric Acid Solution = oz/gal Caustic Soda

Analysis for Sodium Cyanide

1. Pipette 2.0 ml bath sample into a 250 ml volumetric flask and dilute to 100 ml with distilled water.
2. Add 50 ml of Cyanide Indicator.
3. Titrate with Standard 0.153 N Silver Nitrate Solution to a yellow-white opaque endpoint.

FACTOR: Standard 0.153 N Silver Nitrate Solution = oz/gal Sodium Cyanide

HANDLING AND STORAGE

COLCAD 100 is considered an industrial chemical and contains nickel salts. Care should be taken when handling this product. Rubber gloves and safety glasses should be worn. Please refer to the MSDS sheet for complete safety and handling information. Please store in warm environment and do not freeze. Store away from oxidizing materials.

Plating solutions employing COLCAD 100 are highly alkaline and toxic, and all the customary precautions associated with the use of cyanide solutions should be observed.

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 COLCAD 100 freezes, warm to 80-90°F/27-32°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 any responsibility of the use of this product by the customer in any process which may infringe the patents of third parties.