

DATA SHEET

DEVECO ACID ZN/CO PLATING

Deveco Acid Zinc Cobalt plating system offers a zinc alloy containing 0.1% - 0.9% (by weight) cobalt. This system provides a bright, ductile deposit with excellent corrosion protection properties. Deveco specified conversion coatings (ea. chromates) should be used for maximum corrosion protection.

OPERATING PARAMETERS:

Barrel Operation:

pH	5.0 – 6.2
Zinc	2.5 – 4.5 oz/gal
Potassium Chloride	15.0 – 20.0 oz/gal
Ammonium Chloride	5.0 – 8.0 oz/gal
Zn/Co Brightener	based on Amperage & Dragout Make-up: 1.0%
Zn/Co Wetter	3.0 – 6.0 oz/gal
Cobalt	0.2 – 0.5 grams/liter

Rack Operation:

pH	5.0 – 6.2
Zinc	3.0 – 5.0 oz/gal
Potassium Chloride	15.0 – 20.0 oz/gal
Ammonium Chloride	5.0 – 8.0 oz/gal
Zn/Co Brightener	based on Amperage Make-up: 1.0%
Zn/Co Wetter	3.0 – 6.0 oz/gal
Cobalt	0.1 – 0.4 oz/gal

CONDITONS OF OPERATION:

Temperature	70 - 110°F
Current Density	1 – 80 amps/sq ft
Anode Area	1:1 minimum anode to cathode

MAINTENANCE OF SOLUTION:

Zinc	Analysis
Cobalt	Analysis
Potassium Chloride	Analysis
Zn/Co Brightener	Amp Hour or Hull Cell Amp Hour = 1 gallon of Zn/Co Brightener per 20,000 – 30,000 amp hours
Zn/Co Wetter	By dragout

MAKE-UP PER 100 GALLONS:

1. Use lined steel tank leached with 5% HCl for 24 hours
2. 50 gallons warm water 110 - 120°F
3. 6.25 gallons concentrated ZnCl solution
4. 112.5 lbs Potassium Chloride
5. 37.5 lbs Ammonium Chloride
6. .6 lbs or 266 grams Cobalt Chloride
7. Adjust pH to 5.5

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RECOMMENDED PROCESS CYCLE:

1. Soak Clean
2. Thorough water rinse
3. Anodic clean (12 volt rectifier)
4. Cold water rinse
5. Hydrochloric Acid 50% plus Deveco Inhibitor K-1 5%
6. Thorough water rinse
7. Zn/Co Process
8. Thorough water rinse
9. Sour rinse—nitric acid—1/2 oz/gal
10. Chromate dip
11. Cold water rinse
12. Warm water rinse
13. Dry

ANALYTICAL PROCEDURES:

Zinc Analysis (Non-Formaldehyde Method)

Reagents:

1. Acetate Buffer D.S.
To make up, dissolve:
 - a) 180 grams of Sodium Acetate
 - b) 30 ml of Acetic Acid
 - c) Add D.I. or Distilled Water to make 1 liter
2. Xylenol Orange Indicator
To make this indicator liquid:
 - a) One gram of Xylenol Orange
 - b) Dissolved in 1 liter of D.I. or Distilled Water
3. 0.1M Disodium EDTA Solution

Procedure:

1. Into a 400 ml beaker pipet a 5ml bath sample.
2. Add 150 ml Distilled or D.I. water.
3. Add 50 ml Acetate Buffer D.S.
4. Add sufficient Xylenol Orange Indicator (~0.5 ml) to give a fuchsia color (bright reddish pink)
5. Titrate with 0.1M Disodium EDTA solution until the color changes (fuchsia \Rightarrow yellow). This changes very rapidly; proceed very slowly. In some baths an orange color will occur seconds before the yellow.
6. Calculation: $\text{ml of titration} \times 0.176 \text{ per ml} = \text{Total metal in oz/gal}$
 $\text{ml of titration} \times 1.32 \text{ per ml} = \text{Total metal in g/l}$
7. $\text{Total Metal in oz/gal} - \text{Co in oz/gal} = \text{Zinc in oz/gal}$
 $\text{Total Metal in g/l} - \text{Co in g/l} = \text{Zinc in g/l}$

Analysis for Cobalt in the Bath:

Check the Cobalt in the bath on the Atomic Absorption unit. Use the procedure as provided by your AA supplier.

Analysis for Chloride in the Bath:

1. Pipette a 1 ml sample of the plating bath into an Erlenmeyer flask.
2. Add about 5 ml of 10% Sodium Chromate to give the solution a yellow color.
3. Add 75 – 100 ml of distilled water.
4. Titrate with 0.1N Silver Nitrate until permanent reddish brown color forms on a white chloride.

Calculation: Oz/gal of Cl = 0.473 x mls of Silver Nitrate.

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To increase composite Cl 1 oz/gal add 12.5 lbs. Potassium Chloride (KCl) per 100 gallons of plating bath.

Analysis for Ammonium Chloride in the Bath:

Hach Color Wheel Method: Ni-8 color wheel and Nessler Reagent, both available from Hach Corp.

Read Material Safety Data Sheet before using this product.

DISCLAIMER:

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Product Data Sheet/PZ039, PZ040

Effective Date: 06/23/00