

ZINCOPASS BLACK

HEXAVALENT BLACK PASSIVATE

INTRODUCTION

Zincopass Black is a process designed for producing a rich, uniform, haze-free black chromate on zinc plate. Suitable for acid, alkaline and cyanide zinc deposits, it also produces a nice black finish on cyanide cadmium deposits*. Zincopass Black is preferably used for rack plating, but can be used in basket or barrel operations (see Notes).

BENEFITS

- Uniform jet black color
- Enhanced corrosion protection
- Easy-to-control process
- Long solution life
- Works on cadmium plate

SOLUTION MAKE-UP

Zincopass Black Part 1	19.5% v/v
Zincopass Black Part 2	4.5% v/v
DI Water	Balance

OPERATING DATA

Concentration Part 1	19.5% v/v
Concentration Part 2	4.5% v/v
Temperature	68 – 98°F
Time	1 – 3 minutes
pH	1.5 – 2.5 (see Notes)
Zinc Loading	12 – 15 g/L

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EQUIPMENT

Tanks	Polypropylene, PVC, or polyethylene, or steel lined with these materials
Heaters	PTFE immersion
Agitation	Mild air
Ventilation	Recommended

INSTALLATION

It is essential that the tanks to be used for Zincopass Black are thoroughly cleaned and leached before any product is introduced.

If there is any doubt as to the cleaning procedure please contact Automated Chemical Solutions.

1. Add DI water to one-half tank volume. (See Notes).
2. Add 19.5% v/v Zincopass Black Part 1 and mix thoroughly.
3. Add 4.5% v/v Zincopass Black Part 2 and mix thoroughly.
4. Add to level with DI water and mix thoroughly.
5. Adjust pH to 1.9 – 2.1 and mix thoroughly. (See Notes)

PROCESS SEQUENCE

1. Zinc plate
2. Rinse
3. Rinse
4. 0.5% v/v sulfuric dip (alkaline zinc only)
5. DI Rinse
6. Zincopass Black
7. Rinse
8. Rinse
9. Warm air dry 130°F max

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MAINTENANCE AND CONTROL

The solution should be analyzed regularly and replenished as necessary. (See Analysis Method)

Zincopass Black Part 1 concentration is controlled by analysis.

Zincopass Black Part 2 is added in ratio with Zincopass Black Part 1:

For every 10 ml/L addition of Zincopass Black Part 1, add 6.2 ml/L Zincopass Black Part 2

Do not pre-mix Part 1 and Part 2. Add Part 1 and mix thoroughly before adding Part 2.

pH+ can be adjusted with 25% sodium hydroxide and pH- with 10% sulfuric or acetic acid.

As a general guide, when the zinc concentration of the Zincopass Black reaches 12 - 15 g/L the solution should be replaced. Bleed-and-feed is another option for extending life of bath.

ANALYSIS METHOD

Reagents

1. 0.1N sodium thiosulfate
2. 50% v/v hydrochloric acid
3. Ammonium bifluoride
4. Potassium iodide
5. Iodine indicator solution

Method

1. Pipette 2.0 mls working solution into a 500 ml Erlenmeyer flask.
2. Add 25 mls 50% hydrochloric acid.
3. Add 100 mls DI water.
4. Add 1 g ammonium bifluoride and mix.
5. Add 2 g potassium iodide and mix.
6. Titrate with 0.1 N sodium thiosulfate to a pale straw yellow color. Add 2 mls of iodine indicator solution and continue titrating to a clear, pale green end point.

Calculation

$\% \text{ v/v Zincopass Black Part 1} = \text{mls } 0.1 \text{ N sodium thiosulfate} \times 0.970$

Replenishment

For every 1.0% v/v Zincopass Black Part 1 required:

Add 1.0% v/v Zincopass Black Part 1 and 0.62% v/v Zincopass Black Part 2

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NOTES ON THE USE OF ZINCOPASS BLACK

Solution Make-up	DI water is recommended for Make-up. Tap water maybe used but this will cause silver to be precipitate. This must be compensated for by extra addition of Zincopass Black Part 2.
pH	For acid chloride or cyanide zinc deposits 1.5 - 2.5. For alkaline (non-cyanide) 1.9 – 2.1.
Immersion time	Will vary depending on concentration, temperature, pH, solution age, and type of zinc deposit. Excessive treatment time will produce soft, easily damaged coatings.
Process sequence	Following zinc plating, the work should be rinsed thoroughly and alkaline zinc deposits should be neutralized in a 0.5% v/v sulfuric acid dip. Chloride zinc deposits should be rinsed thoroughly to ensure no drag-in of chloride to the Zincopass Black.
Zinc Thickness	A freshly prepared Zincopass Black will need a zinc deposit of 0.3 mils minimum, but generally 0.2 mils deposit is satisfactory.
Drying	The Zincopass Black film is soft until dried and should therefore be handled carefully. Work should be warm air dried, maximum temperature 130°F.
Barrel Processing	Because the black chromate film is soft and easily damaged before drying, treatment of barrel plated work is difficult in the plating barrel. The work should be transferred to baskets after zinc plating then treated in the Zincopass Black by gentle, occasional agitation of the basket. NB: Baskets should be of all plastic construction (polyethylene, polypropylene or PVC) or metal coated with these materials.
Chlorides	Drag-in of chlorides can reduce the blackness of the coating and will need to be compensated for by additional Zincopass Black Part 2. If excess chlorides are suspected, add 15 mls/L Zincopass Part 2 and re-check parts.
UV absorption:	All silver-based black chromates are susceptible to turning dark green in sunlight over an extended period of time. Zincopass Black has proven to take longer to be affected or is more resistant to UV light than competitive products.
*Cadmium:	Zincopass Black produces a rich dark black on 0.5 mils cadmium. Deposits from alkaline cyanide baths require good rinsing prior to entering the acidic chromate.

STORAGE

Store in original containers above 40°F

SAFETY

CAUTION! Zincopass Black Part 1 and Part 2 contain acidic components. Avoid contact with eyes, skin and clothing. Wear chemical handler's gloves, goggles and protective clothing when handling. Read and understand Material Safety Data Sheet before using this product.

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PRODUCT GROUPS

The following products are referred to in this data sheet.

PRODUCT NAME	PRODUCT NUMBER
ZINCOPASS BLACK PART 1	237010
ZINCOPASS BLACK PART 2	237011

NOTICE

The information and recommendations of PMD (UK), Ltd. and Automated Chemical Solutions, Inc., and its representatives, regarding this product are, to the best of our knowledge, true and accurate. We make no guarantee of results because the conditions of actual use are beyond our control. We assume no liability for damages or penalties resulting from the use of this product or following our recommendations. Our recommendations and suggestions for use of this product are not intended to grant license to operate under or infringe any patent.

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