



Havastar ZN Gleam | Plating Processes

Havastar ZN Gleam is an extremely bright, simple to use, “two component” alkaline non-cyanide zinc plating system designed to produce lustrous deposits over a wide range of current densities. **Havastar ZN Gleam** is specially formulated to work equally well in both rack and barrel installations

FEATURES AND BENEFITS

1. Deposits easily accept chromate and passivation conversion coatings, including black, olive drab and all trivalent passivates.
2. Has excellent zinc distribution and will convert from most alkaline non-cyanide zinc systems in the market today.

OPERATING PARAMETERS

1. 65-100°F (optimum 85°F)
2. 5-10 ASF barrel, 10-25 ASF rack

SOLUTION MAKE-UP

Product	Range	Rack (Optimum)	Barrel (Optimum)
Zinc Metal	0.8-2.5 OPG	1.3 oz/gal	1.5 oz/gal
Caustic Soda	12-20 OPG	16 oz/gal	18 oz/gal
Havastar ZN Gleam A (H002836)	1-1.5% by vol	1% by vol	1.0% by vol
Havastar ZN Gleam B (H003235)	1-2% by vol	1.25% by vol	1.5% by vol
Havtech ZN Purifier (H000911)	As Nec.	0.1% by vol	0.1% by vol

MAINTENANCE AND PROCESS CONTROL

Addition Agent	Ampere Hours/Gallon
Havastar ZN Gleam A	30,000-60,000
Havastar ZN Gleam B	15,000-30,000
Havtech ZN Purifier	On demand/as req.

ANALYSIS

Titration for Zinc Metal

1. Pipette 5 mL bath sample into a flask
2. Add approximately 75 mL “Alkaline Zinc Buffer solution” (preparation procedure detailed below)
3. Add approximately 0.1 g xylenol orange indicator
4. Titrate with 0.1 M EDTA to a color change from purple to yellow.

$$mL \text{ titrated} \times 0.174 = \frac{oz}{gal} \text{ zinc metal}$$

Titration for Caustic Soda

1. Add 5 mL of the working bath into beaker
2. Add 25 mLs 25% barium chloride solution. Solution will form a white precipitate
3. 3-5 drops phenolphthalein to beaker
4. Titrate with 1.0N hydrochloric acid solution to a white endpoint

$$mLs \text{ titrated} \times 1.06 = \frac{oz}{gal} \text{ caustic soda}$$

Alkaline Zinc Buffer Solution: In a 2 L volumetric flask, add 180 g sodium acetate tech. grade powder. Dilute with 500 mL DI water and stir until most of the sodium acetate powder is dissolved. Add 30 mL glacial acetic acid. Dilute to the mark and shake/stir well until all of the sodium acetate is in solution

MAINTAINING THE ZINC LEVEL

The dissolution rate of zinc metal in the plating bath is determined by caustic soda content, anode area, temperature, agitation, drag-in/drag-out rate and electrical current. The use of a generator tank is highly recommended to control and maintain the metal at optimal levels. If a generator tank is not used, the zinc anodes must be partially or entirely removed from the plating tank during an extended bath shut-down to stop zinc metal build-up.

Literature and technical information on zinc generator tanks can be obtained by contacting a Technical Representative at **Haviland Products Company**.

HULL CELL EVALUATION

The plating bath should be checked daily by running non-agitated 2 ampere – 5 minute and 2 ampere - 10 minute hull cell panels with zinc or steel anodes.

Use a **Havastar NCZ** trouble shooting guide as a helpful tool for Hull Cell panel problem solving.

Plate distribution test for use as a guide to determine the **Havastar ZN Gleam Part A** content:

1. Run a non-agitated 2 ampere-30 minute Hull Cell panel using a steel anode. The solution should be maintained as close as possible to the working bath temperature.
2. Rinse the Hull Cell panel under cold water and dry. Do NOT dip in a nitric or chromate solution.
3. Using a Hull Cell ruler, take thickness reading with an XRF at 4 ASF and another at 80 ASF.
4. Calculate the high to low current density thickness ratio by dividing the thickness of the HCD reading by the LCD reading.

Depending on the efficiency and throwing power requirements, the optimum thickness ratio is approximately 1.5-2.5. A thickness ratio above 2.5 is an indication of generally low **Havastar ZN Gleam Part A** relative to the zinc metal and general bath efficiency. Caustic soda content, chromium contamination, bath temperature, poor filtration,

purifier overload, and organic contaminants may all have an effect on this test.

TYPICAL PROCESS SEQUENCE

1. Hot alkaline soak cleaner
2. Hot alkaline electroclean (optional)
3. Rinse (counterflow recommended)
4. 30-50% HCl pickle
5. Rinse
6. Caustic pre-dip in the 1-2 oz/gal caustic solution.
7. Zinc plate

SAFETY INFORMATION

- Follow MSDS / SDS / MDS information for products used in this process.

WASTE DISPOSAL

Waste treatment must be done by a trained waste treatment operator with knowledge of similar processes prior to discharging to municipal water supply.

NON-WARRANTY

The data contained in this bulletin is believed by HAVILAND PRODUCTS COMPANY to be accurate and complete. Since however, final methods of use of these products are in the hands of the customer beyond our control, we cannot guarantee that the customer will obtain the results described in this bulletin. We cannot assume any responsibility for the use of this product by the customer in any process which may infringe the patents of third parties. Follow all federal, state and local requirements.