



1000 Western Drive
 Brunswick, OH 44212
 PHONE: 330-225-3200
 FAX: 330-225-1499
 www.columbiachemical.com

Zinc-Chro-SHIELD®

TECHNICAL DATA
 03-10-2021

Zinc-Chro-SHIELD®

A UNIQUE SEALER FOR PASSIVATED ZINC ELECTROPLATE

- Zinc-Chro-SHIELD® provides over 100 hours of salt spray protection over a hexavalent blue passivate to less than 5% white corrosion.
- Zinc-Chro-SHIELD® provides over 600 hours of salt spray protection over a yellow hexavalent passivate to less than 5% white corrosion.
- Zinc-Chro-SHIELD® provides over 350 hours of salt spray protection over high performance trivalent passivates to less than 5% white corrosion.
- Zinc-Chro-SHIELD® is used as a final rinse, so there is no additional equipment required.
- Zinc-Chro-SHIELD® operates at room temperature to 140° F (60° C).
- Zinc-Chro-SHIELD® has very low viscosity and produces very thin coatings making it suitable for both rack and barrel operations. *

*NOTE: Zinc-Chro-SHIELD® reduces adhesion for paint, powder and e-coat, and reduces electric conductivity.

OPERATING PARAMETERS

SOLUTION MAKE-UP FOR 100 GALLONS

Zinc-Chro-SHIELD®:	5 gallons
Water:	95 gallons

	<u>RANGE</u>	<u>OPTIMUM</u>
Zinc-Chro-SHIELD® Concentration:	1 - 8% by volume	5% by volume
Dip Time:	5 seconds - 2 minutes	30 seconds
Temperature:	60 - 140° F (16 - 60° C)	As needed for drying of parts
pH:	10.5 - 12.0	11.0

SOLUTION MAKEUP

<u>CONVERSION COATING</u>	<u>Zinc-Chro-SHIELD® APPLICATION</u>	<u>CORROSION PROTECTION</u>
Zinc Plate Only	Zinc Plate - Multiple Rinses ZCS Dip - Dry	Fair to Good
Blue Bright	Zinc Plate - Multiple Rinses - Passivate - Multiple Rinses - ZCS Dip - Dry	Excellent
Yellow/Iridescent	Zinc Plate - Multiple Rinses - Passivate - Multiple Rinses - ZCS Dip - Dry	Excellent
Black (Silver Containing)	Not Recommended - Use Zinc-Chro-SHIELD® AFTERBLACK	None
Olive Drab	Zinc Plate - Multiple Rinses - Passivate - Multiple Rinses - ZCS Dip - Dry	Good to Excellent

EQUIPMENT

TANKS:

Polypropylene, PVC, carbon steel and stainless-steel tanks may be used.

HEAT SUPPLY:

Electric - Plain steel immersion heater. Quartz heaters are not recommended.

Steam - Mild steel heating coils.

ANALYTICAL PROCEDURE

Zinc-Chro-SHIELD® working solutions can be replenished using either of two methods:

METHOD 1: REPLENISHMENT BY ANALYSIS

Determination of Percent Zinc-Chro-SHIELD® in Dip Tank

1. Pipette a 25 mL sample of working sealant solution into a 250 mL Erlenmeyer flask.
2. Add 4 drops of Phenolphthalein indicator solution to the flask.
3. Titrate with 0.1N HCl to a colorless endpoint. (Titrate over a white background to help determine endpoint).

FACTOR: $\text{mLs of 0.1 N HC} \times 0.225 = \% \text{ Zinc-Chro-SHIELD® in dip tank}$

NOTE: The solution should be adjusted to the optimum concentration of 5% Zinc-Chro-SHIELD® by volume.

METHOD 2: REPLENISHMENT BY DRAGOUT DETERMINATION

EXAMPLE: The drag-out per day for an average barrel plating tank is 5% by volume. If the plating tank is 5 times the size of the final rinse tank, the final rinse tank will lose 25% by volume per day. Since the optimum initial charge of Zinc-Chro-SHIELD® is 5% by volume (10 gallons for a 200-gallon tank), then 25% of this initial charge or 2.5 gallons must be added each day (along with water to keep the total volume at 200 gallons).

The drag-out per day for an average rack plating tank is 1% by volume. Using the same calculation as above for a 200-gallon final rinse tank and plating tank 5 times its size, the final rinse will lose 5% by volume per day. This means that ½ gallon of Zinc-Chro-SHIELD® must be added each day.

NOTE: A technical representative from Columbia Chemical can help you determine the addition requirements for your particular plating operation.

EVALUATION OF THE Zinc-Chro-SHIELD® FILM ON PARTS

Pull one part before Zinc-Chro-SHIELD® dip and one finished part (preferably from same rack or barrel).

To determine proper coverage of Zinc-Chro-SHIELD® a 5% (wt./vol.) Lead Acetate Drop Test is used.

1. Prepare 5% Lead Acetate Solution.
2. Place one or two drops on the part with no Zinc-Chro-SHIELD® dip and on the finished part simultaneously. Record time drop(s) applied.
3. Observe time it takes to turn dark under drop(s).
Finished parts should take approximately twice as long to be affected (turned dark) by the lead acetate solution.

TYPICAL TIMES TO FAILURE (MINUTES)**BLUE PASSIVATE**

Blue Passivate only	2-3 min.
Blue + Zinc-Chro-SHIELD®	> 6 min.

YELLOW PASSIVATE

Yellow Passivate only	4-5 min.
Yellow + Zinc-Chro-SHIELD®	> 8 min.

As concentration of Zinc-Chro-SHIELD® decreases so does time to failure.

If time to failure is below table values, additions of Zinc-Chro-SHIELD® should be made to the dip tank. (See Methods 1 or 2 for replenishment of Zinc-Chro-SHIELD®).

CURING OF Zinc-Chro-SHIELD® FILM PRIOR TO SALT SPRAY TESTING

For optimum corrosion protection, the Zinc-Chro-SHIELD® film on plated parts should cure or age at ambient temperatures for 24 - 48 hours before salt spray testing.

HANDLING & STORAGE

Columbia Chemical recommends referring to the specific product Safety Data Sheets for safety, handling, and storage precautions.

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.

