Product Bulletin
Product Name: Hallcoat T100
Product Code: 2422001
Revision Date: September 19, 2024

Hallcoat T100

Hallcoat T100 is a trivalent chrome passivate, providing corrosion protection on all types of Zinc-plated surfaces for 100 hours or more to white corrosion in an ASTM B-117 operating salt spray chamber, without a post top coat. Hallcoat T100 produces a bright blue finish and meets the requirements of ASTM B 633 Type II.

Features & Benefits

- Meets requirements of ELV specifications & is RoHS compliant.
- Hexavalent chromium-free for economical waste treatment.
- Single-component liquid additive for ease of use and product maintenance.
- Receptive to post seals & top coats.
- Corrosion protection exceeds that of most blue passivates.
- Significantly exceeds the bath service life compared to hexavalent blue passivates.
- Exceptional tolerance to contaminants, prolonging quality passivation.
- Applied in rack, barrel, continuous and strip plating lines.

Equipment

Tanks	Polypropylene, PVC, Polyethylene
Heaters	PTFE – coated stainless steel) Types 302, 304)
Racks	Polymer Coated

A Hubbard-Hall sales engineer or our Technology Center will be pleased to recommend the appropriate equipment based on the specific line installation condition.

Bath Make up & Operating Conditions

Consult Safety Data Sheet for proper handling and protective clothing requirements.
Conversion of previously used hexavalent chromium passivate tanks & equipment require proper & complete leaching treatment to eliminate all traces of hexavalent chromium before proceeding with makeup of the Hallcoat T100 bath. Hubbard-Hall technical service personnel can recommend an appropriate hexavalent chrome treatment process for the leachate.

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Barrel Application

	RANGE	Optimum
Concentration	3-7% by volume	5% by volume
PH	1.8-2.2	2.0
Temperature	64-82 °F (18-28 °C)	73 °F (23 °C)
Immersion Time	25-90 seconds	As Required
Agitation	Recommended	

Rack Application

	RANGE	Optimum
Concentration	1-7% by volume	4% by volume
PH	1.8-2.2	2.0
Temperature	64-82 °F (18-28 C)	73 F (23 °C)
Immersion Time	15-90 seconds	As Required
Agitation	Strongly Recommended	

Continuous & Strip Lines

	RANGE	Optimum
Concentration	1-7% by volume	4% by volume
PH	1.8-2.2	2.0
Temperature	64-82 °F (18-28 °C)	73 °F (23 °C)
Immersion Time	15-90 seconds	As Required
Agitation	Strongly Recommended	

Replenishment

The pH and Hallcoat T100 bath concentration are controlled and maintained with additions of Hallcoat T100 product concentrate. This can be determined by analysis or by observing quality of the passivated parts being processed.

Alternatively, concentration of Hallcoat T100 can be determined by wet analysis and Atomic Absorption spectroscopy. These procedures are provided on a separate technical data analysis form.

Control

It is essential to maintain pH between 1.8 and 2.2. Values higher or lower will affect color, luster and corrosion resistance. pH is lowered using Nitric Acid and raised by adding 25% sodium hydroxide.

Analysis Procedure

Determination of Hallcoat T100 by Titration

Reagents Required:

- Sodium hydroxide, 1 N
- Hydrogen peroxide, 35%
- Hydrochloric acid, conc.
- 10% nickel sulfate or nickel chloride solution
- Sodium thiosulfate solution, 0.1 N
- Starch solution, 1 %
- Ammonium bifluoride
- Potassium iodide

Procedure:

1. Pipette a 10 ml sample of solution into a 250 ml volumetric flask.
2. Add 20 ml of 1.0 N (40 g/l) sodium hydroxide solution and 50 ml of deionized or distilled water.
3. Add 1 ml of 35% hydrogen peroxide and gently boil for 5 minutes. Maintain solution volume with deionized or distilled water.
4. Add 1 ml of 10% nickel sulfate or nickel chloride solution and boil for an additional 2 minutes.
5. Cool to room temperature. The solution should be yellow-brown colored. If not, add an additional 1 ml of 35% hydrogen peroxide and re-boil.
6. Add 25 ml of concentrated hydrochloric acid.
7. Add 1 gram of ammonium bifluoride and dissolve.
8. Add 10 ml of 10% potassium iodide solution.
9. Add 1 ml of starch indicator and titrate with 0.1 N sodium thiosulfate to the disappearance of the blue-black color (light green).
10. Calculate the concentration of Hallcoat T100:

Hallcoat T100 (% by vol.) = (ml of sodium thiosulfate used) x 0.38
Hallcoat T100 (ml/l) = (ml of sodium thiosulfate used) x 3.8

Determination of Hallcoat T100 by Atomic Absorption (AA)

1. Pipette 1 ml of working solution into a 500 ml volumetric flask.
2. Add 10 mls of Aqua Regia and fill up to the mark.
3. Mix well by inverting 10-12 times.
4. Analyze for chromium using AAS and standards of 3 ppm, 5 ppm and 10 ppm.

% Hallcoat T100 = ppm of chromium

Maintenance Tips

Analysis, process control and operating parameters are important to maintain desired corrosion protection of Hallcoat T100 passivated parts.

Solutions of Hallcoat T100 effectively passivate typical commercial zinc plating deposit thicknesses of 0.0003 – 0.0005 inches. It is essential that the plated zinc deposit is in itself relatively free of contaminants such as iron or copper.

Significant iron contamination of the passivating solution shortens the service life of the working Hallcoat T100 bath. Any parts that have fallen off the rack or barrel must be removed quickly to keep iron levels below 200 ppm. Typically, a yellow film will develop if iron levels are too high, in which case the bath would need to be diluted or made up new. If bath pH is out of the recommended range, raise by adding 25% sodium hydroxide or lower it by adding nitric acid.
A pre-dip consisting of 0.25% by volume of Nitric Acid is recommended where post plate zinc rinsing may not be sufficient, in order to neutralize films

Parts passivated in Hallcoat T100 are not dehydrated upon heated spin drying, unlike the film dehydration which occurs when applying hexavalent passivates. If the Hallcoat T100 bath is air-agitated, an in line filter is recommended to remove any oil droplets that may be introduced from a compressor.

Troubleshooting Guide

Condition	Result of	Corrective action
Yellow iridescence	Iron contamination	Remove dropped parts, make up new bath
Yellow iridescence	Long immersion, high pH	Adjust as required
Low corr. protection	Low bath temp. pH off spec	Adjust as required
Poor bbl. passivating	Bbl. RPM high, small perf. holes	Adjust RPM, change to larger perforation holes
Short bath life	Excess drag in, iron	Improve rinsing, retrieve parts, new bath
Streaked white haze	Post plate zinc rinse	Improve rinsing
Light colored	Low concentration	Adjust to operating range

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Hazard Classification

UN Number	3264
UN Proper Shipping Name	Corrosive Liquid, Acidic, Inorganic, NOS (Nitric Acid)
Transport Hazard Class	8
Packing Group	II
ERG	154

Waste Disposal

Spent solution must be treated and disposed of meeting all applicable Federal, State and Local regulations. This information is general in scope and nature. It may not apply in each type of application.

WARRANTY: THE QUALITY OF THIS PRODUCT IS GUARANTEED ON SHIPMENT FROM OUR PLANT. IF THE USE RECOMMENDATIONS ARE FOLLOWED, DESIRED RESULTS WILL BE OBTAINED. SINCE THE USE OF OUR PRODUCTS IS BEYOND OUR CONTROL, NO GUARANTEE EXPRESSED OR IMPLIED IS MADE AS TO THE EFFECTS OF SUCH USE, OR THE RESULTS TO BE OBTAINED.

Our People. Your Problem Solvers.

For more information on this process,
please call us at 203.756.5521 or email: techservice@hubbardhall.com

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