

TECHNICAL DATA SHEET

TECH BRIGHT AZ 2012

NEW PERFORMANCE BRIGHT CHLORIDE ZINC PROCESS

Tech Bright AZ 2012 is a modern high efficiency chloride zinc plating process. The process produces brilliant, levelled, ductile deposits over a wide current density range. Tech Bright AZ 2012 can be used for rack, barrel, wire and strip operations.

SALIENT FEATURES:

- This process provides improved yellow chromate adhesion due to excellent solubility of addition agents.
- This process provides excellent throwing power and can work trouble free even in higher bath temperatures.
- This process has an improved yellow chromate adhesion due to excellent solubility of additives and brightener in the bath.
- Due to the wide current density plating range the process can plate easily complex shapes with both high and low current density areas on vats and also in barrels.

SOLUTION MAKE - UP:

To make up the 100 ltrs.of operating solution using Tech Bright AZ 2012 process chemicals proceed as follows:

1. Add 50 liters of warm water to the tank.
2. Add 22.5-25 kgs of Tech Bright B with stirring continue the stirring till the salts are completely dissolved.
3. Add 10 ltrs of Tech Bright 2012 A liquid.
4. Pack the filter with activated Carbon and filter the solution to remove any insoluble impurities.
5. Check the pH of the solution and adjust if necessary to 4.8- 5.0 with CP grade hydrochloric acid to lower the pH or potassium hydroxide to raise the pH.
6. Add 3-4 ltrs of Tech Bright 2012 M and 80 ml of Tech Bright 2012 R with stirring.

7. Add sufficient water to bright the solution to final operating level. Now the plating path is ready for use.

MAKE UP CONCENTRATION:

	Range	Optimum
Tech Bright A	90-120 ml/l	100 ml/l
Tech Bright B	200-300 gm/l	250 gm/l
Tech Bright 2012 M	30-50 ml/l	40 ml/l
Tech Bright 2012 R	0.2-0.6 ml	0.4 ml/l

BATH PARAMETERS:

	Vat & barrel	Continuous plating of wires
Zinc metal	25-40 gm/l	35-50 gm/l
Total chloride	120-150 gm/l	130-160 gm/l
Boric acid	20-30 gm/l	30-35 gm/l

OPERATING PARAMETERS:

Cathode current density	0.5-5 a/sqs.dm (VAT & BARREL)
pH (electrometric)	4.8-5.2
Filtration	2-3 turnover / hour
Agitation	Air or Mechanical
Anodes	Pure zinc 99.99%
Temperature	20-45°C

FUNCTION OF SOLUTION COMPONENTS:

ZINC METAL:

The recommended range should be maintained in order to get desired optimum results. Weekly analysis of zinc metal should be made and the necessary daily additions to be done based on this analysis. Metal content can be increased by the addition of Tech Bright 2012 A liquid.

TOTAL CHLORIDE:

The chloride content is increased by addition Tech Bright A & Tech Bright B Salt. Routine analysis and daily additions are necessary to maintain the total chloride within the recommended range.

BORIC ACID:

It is used as a buffering agent, and the replenishment should be done as per the analysis. Low concentration of boric acid can cause burning at high current densities, whereas high concentration of boric acid will reduce the solubility of the brightener and due to reduced solubility, it can form an insoluble film at the anode which will reduce the current from and thereby reduces the anode corrosion.

TECH BRIGHT AZ 2012 M (make- up):

Tech bright 2012 M is normally consumed by drag – out, the addition should be made based upon the hull cell test. Low concentration of Tech Bright 2012 M can cause dark film on the plated components, dull plating in high current density areas, and may result in clouding of the plating solution. Higher concentration of Tech Bright 2012 M may reduce the overall brightness and thus increase the consumption of Tech Bright 2012 R for getting the desired results.

TECH BRIGHT 2012 R:

This is mainly responsible for getting the overall brightness and thus gives the desired results in combination with Tech Bright 2012 M. Addition of brightener is normally controlled by the Hull Cell test. Tech Bright 2012 R is consumed by electrolysis and drag out. Additions can made based on ampere hours once a consistent routine has been established. The bath can be maintained by adding regularly 200-300 ml of Tech Bright 2012 R and 200-300 ml of Tech Bright 2012 M.

The consumption rate given above should be taken as a rough guide for maintaining the brightener balance in the bath. However, the consumption of the Tech Bright 2012 M&R depends upon the degree of brightness required, type of base metal and its operating conditions such as pH, temperature, operating current density and the drag out losses.

For example in case of rack plating Tech Bright 2012 M may have to be added more to reduce the humming tendency and to maintain the deposit ductility. Similarly Tech Bright 2012 M is to be added ore as compared to Tech Bright 2012 R to improve the coverage for components having deep recesses to be plated in barrel.

pH:

The optimum pH of the bath is 4.8 and should be checked and corrected daily. After additions of the chloride, the pH should be checked. Low pH below 4.5 is usually a result of adding an excess of acid, and will result in misplating and matt deposits. High pH causes burning and dull deposits.

TEPERATURE:

Temperature range of operating this solution is 20-45°C. Higher temperature operation is suitable for continuous plating of wire and strip. To maintain the temperature within optimum range titanium cooling is recommended. If the temperature of the solution in winter season falls below 18°C, we recommend installing a heater to maintain the temperature above 22°C especially for rack plating.

CURRENT DENSITY:

The recommended current density range for barrel plating is 0.2-2.5 amps per square mm and Voltage range is 2-10 vols. For rack plating, the average current density is 2.7 amps per square d. With rack plating, sufficient air agitation is necessary to plate at higher current densities without burning.

AGITATION:

Agitation for rack plating can be supplied with cathode rod, air, or solution circulation via filter pump. For rack plating cathode rods movements should be at a range of 4-10 feet per minute. Low pressure, clean filtered air from an air pump, not a compressor is recommended. Too high air agitation will cause excess forming but insufficient agitation will result in burning at the high current density areas.

TANKS:

Acid resistant plastic lined tanks, such as polypropylene or polyethylene are suitable. Rubber lined tanks are not suitable for bright chloride zinc solution.

ANODES:

The anodes should be 99.99% zinc. When using zinc slabs, titanium is used for anode hooks. Anode area should be at least 1.5-2 times as compared to cathode area.

COOLING:

Cooling coils of titanium or Teflon are recommended. Making the titanium coil slightly anodic is recommended to avoid dissolution under the influence of cathodic current.

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