ZINCAL NCZ - 400

ALKALINE NON CYANIDE ZINC PROCESS

ZINCAL NCZ - 400 is a cyanide free alkaline zinc process which produces ductile, lustrous zinc deposits over a wide current density range. The process eliminates the usage of poisonous cyanide, which in turn reduces the waste treatment cost and makes it more environment friendly.

The process consists of three liquid additives viz. ZINCAL NCZ – 400 A, ZINCAL NCZ – 400 B and ZINCAL NCZ – 400 C

SALIENT FEATURES:

- Cyanide free process.
- Conventional plating equipments required for cyanide zinc plating can be used.
- Excellent metal distribution gives a more uniform plating.
- Excellent low current density coverage.
- Better Chromate bonding than Chloride zinc process.

BATH COMPOSITION

<table>
<thead>
<tr>
<th>Component</th>
<th>Range</th>
<th>Optimum</th>
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<tbody>
<tr>
<td>ALKALINE ZINC SALT</td>
<td>100 – 120 g/ltr</td>
<td>110 g/ltr</td>
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<tr>
<td>ZINCAL NCZ - 400 A</td>
<td>10 – 15 ml /ltr</td>
<td>12 ml /ltr</td>
</tr>
<tr>
<td>ZINCAL NCZ - 400 B</td>
<td>0.4 – 0.8 ml/ltr</td>
<td>0.5 ml/ltr</td>
</tr>
<tr>
<td>ZINCAL NCZ - 400 C</td>
<td>0.8 – 1.2 ml/ltr</td>
<td>1.0 ml/ltr</td>
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OPERATING CONDITIONS

- Temperature: 22 – 32ºC □ 26ºC
- Current density: 1 - 3 A/dm² (Vat) 0.5 – 1.5 A/dm² (Barrel)
- Fume Extraction: recommended

SOLUTION PREPARATION

Fill the solution to 3/4th its volume with clear water. Add calculated amount of ALKALINE ZINC SALT. Heat is generated by the dissolution of salt and it is recommended that the salt be added in small increments with continuous stirring. Dissolution is completed when initial cloudiness disappears. Fill to 90% of the total volume with water and allow the solution to cool to room temperature. Dummy the bath at low current density for 3 – 4 hrs. Add the required quantity of ZINCAL NCZ-400 A, ZINCAL NCZ – 400 B and ZINCAL NCZ - 400 C and mix well.

The Electrolyte is ready for use.

BATH MAINTENANCE AND CONTROL:

ZINC AND SODIUM HYDROXIDE

The required concentrations of the bath constituents can be maintained by periodic analysis. The content is to maintained at

- ZINC: 8 - 10 g/ltr
- CAUSTIC: 90 - 110 g/ltr

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In case of high zinc content in the bath MS sheet coated with Nickel can partially replace the zinc anodes. In case of a low zinc metal content the zinc anodes can be left in the bath even during idling period. Unplated steel sheets are not recommended.

Sodium hydroxide content in the bath is to be maintained within the recommended range in order to get the proper throwing power and uniform metal distribution. In case any addition of sodium hydroxide is required, it should be done by making solution of it separately and after cooling it to room temperature.

Due to electrolysis and carbon dioxide from the air, sodium carbonate accumulates in the bath. Concentration of sodium carbonate in the bath should be kept at less than 60 g/l.

**ADDITIONS AGENTS**

ZINCAL NCZ – 400 A is the main carrier brightner and ZINCAL NCZ 400 B is a booster which along with ZINCAL NCZ 400 A gives good bright low current density area. ZINCAL NCZ – 400 C is a purifier which eliminates dark deposits on the plated surface caused by impurities in the bath. The approximate additions recommend are

- ZINCAL NCZ 400 A: 150 – 250 ml / 1000 Amp hr.
- ZINCAL NCZ 400 B: 75 – 100 ml / 1000 Amp hr.
- ZINCAL NCZ 400 C: 50 – 75 ml / 1000 Amp hr.

**TEMPERATURE:**

Bath temperature is to be maintained between 22 - 32°C. Higher temperature reduces the brightness and throwing power. Temperature below 22°C must be avoided as it can result in adhesion problems (blistering) of the deposits.

**PRE- TREATMENT**

Since the cleaning ability of alkaline non-cyanide zinc bath is relatively poor, cleaning cycles must be similar to those for chloride zinc or bright nickel plating.

An Alkaline dip of 30 g/ltr sodium hydroxide is highly recommended immediately prior to the plating to neutralise any acid on the surface of the metal.

**EQUIPMENT:**

- Tank: PVC, polypropylene or rubber lined steel tanks can be used
- Fume extraction: Recommended.
- Agitation: Barrel 3 – 6 rpm.
- Filtration: Required with 1 – 2 bath turnovers per hour. Alkaline resistant Polypropylene cartridges are preferred.

**NOTE:**

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