



PT. SINAR CEMARAMAS ABADI

- VERCOPPER (ACID / CYANIDECOPPER)
- VERNICKEL
- VERCHROME
- VERZINC ACID / CYANIDE ZINC
- CLEANER (ELEKTRO / SOAK)
- PHOSPHATING
- CHROMATING
- ELECTROLESS NICKEL

FOR HIGHTECT ELECTROPLATING :

- ELECTROLESS NICKEL PLATING FOR ALUMINIUM AND ZINC DIE CAST, MAGNESIUM
- GOLD PLATING
- PTFE FORELECTROLESS NICKEL
- HARDCHROM
- SAND CAST ALUMINIUM ALLOYS PLATING
- MAGOXID - COAT FOR PROTECTING MAGNESIUM SUBSTRATES

- KEPLA - COATING FOR ALUMINIUM AND TITANIUM ALLOYS
- ELECTROLESS NICKEL PLATING WITH INTEGRATED SILICON CARBIDE PARTICLES (SIC)
- GLISS - COAT
A CLEAN SOLID FILM LUBRICATION FOR A MAINTENANCE FREE PERMANENT LUBRICATION OF ALL KIND OF FRICTION PAIRINGS
- SEPA - COAT
(ANTI ADHESIVE COATING AND ACTIVATOR) FOR THE REMOVAL OF PART FROM MOULDS

3. PRETREATMENT

An optimum pretreatment of the parts is very important. Concerning pretreatment it is to say that this must correspond with the pretreatment for the nickel plating.

Above all, by use of potassium chloride as conducting salt, a very good pretreatment is decisive.

4. EQUIPMENT

Steel, with hard rubber or synthetic linings, synthetic tanks.

5. FILTRATION

Constant filtration is vital for high-performance rack baths.

6. AGITATION

For zinc plating in rack baths a good air agitation is very important. 3- 5 m³ of oil-and dust-free air per hour and m² of bath surface are necessary.

The air agitation shows the advantage that precipitated iron is continuously being oxidised and following led off through the filter pump.

7. ANODES

It is important to use a very good quality of zinc anodes (99,99 % Zn).

For rack baths the titane baskets should be provided with anode bags. This is very important in order to avoid roughness. The material of the anode bags shall refer to that one, which is used in nickel baths.

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8. IMPORTANT ADVICE

At zinc plating in barrels perforation spots occur again and again on flat parts, which are by hook and by crook problematic to zinc plate (stick one on top of the other).

In case that this appearance is grave and if the conducting salt is potassium chloride, we recommend to add 10 – 20 g/l of ammonium chloride to the bath.

By that means, these problems occurring again and again at zinc plating in barrels, are as good as eliminated. It goes without saying that ensuing regularly small quantities of ammonium chloride should be added. If e.g. 20 g/l of potassium chloride are added, 2 g/l of ammonium chloride should be admixed.

9. BATH COMPOSITIONS

AMMONIA-BATH:

CHEMICALS	BARREL	RACK
Zinc chloride	40 g/l	80 g/l
Ammonium chloride	80 g/l	150 g/l
pH-value	4,6 – 5,4	4,6 – 5,4

Above plating solutions are typical ammonia solutions, which can be changed according to each requirement.

Initial addition :

HR AZn MU	30 - 40 ml/l
HR AZn MNT	0,5 - 2 ml/l

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POTASSIUM-BATH :

CHEMICALS	BARREL	RACK
Zinc chloride	50 – 70 g/l	80 g/l
Potassium chloride	180 – 240 g/l	200 g/l
Boric Acid	25 g/l	25 g/l
pH-value	4,6 – 5,4	4,6 – 5,4

Above plating solutions are typical potassium solutions, which can be changed according to each requirement.

Initial addition :

HR AZn MU	30 - 35 ml/l
HR AZn MNT	0,5 - 2 ml/l

10. MAKE-UP OF A PLATING SOLUTION

Chemicals should be dissolved in ½ the required amount of warm, deionized water. After filling up with cold water and filtration, pH should be adjusted and required amounts of **HR AZn Make-up** and **HR AZn MNT** should be added. It is important that **HR AZn Make-up solution** is added first, stirred well, then **HR AZn MNT**.

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11. CONSUMPTION PER 10'000 Ah :

HR AZn MNT

2.0 – 3.5 litres

HR AZn contains the brightener and the proper proportion of wetting agent for normal maintenance. Should, however, part of the wetting agent be emulgated or soaponified, it might be necessary to add HR AZn Make-up.

The required amount of HR AZn can be determined by running Hull Cell panels or by running a stalogramometer test.

Usually the HR AZn process is only operated with the HR AZn MNT. However, with strong drag-outs it can be necessary to add also HR AZn Make-up.

(The make-up solution is solubilizer for the HR AZn MNT, i.e. a sufficiently large content of HR AZn Make-up must always be available.)

Should the above-mentioned white cloud not disappear within a few seconds after addition of **HR AZn MNT**, add 3 – 5 ml/l of Make-up solution **HR AZn**

12. pH – Value

The continuous control of the pH-value is very important. Above all for the potassium chloride as conducting salt the pH-value has to be checked daily and kept within the prescribed range (4.6 – 5.4).

If the pH-value too low, it is increased with KOH (50 %).

If the pH-value is too high, it is decreased with 50 vol.% HCl, chem. pure.

Please add slowly under powerful stirring.

If hydrochloric acid is added without powerful stirring, organic can get precipitated, which cannot be dissolved anymore.

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13. GENERAL INFORMATION

Since acid zinc processes in general have no inherent cleaning power like those of cyanide solutions, it is very important that work to be plated enters the plating tanks thoroughly clean. The pH-value should be checked electrometically at least once every four working hours.

Parts, which may have fallen into the plating tank, should be taken out immediately, to avoid iron contamination. Dark brown spotting or barrel perforation marks are indications of iron contamination.

14. INFLUENCE OF PLATING SOLUTION PARAMETERS

The following statements are not necessarily true for all installations. Parameters can vary and are interdependent on each other. These statements should be considered as guidelines, only, whenever problems occur.

- **Zinc metal concentration too high :**

This can be the reason for a poor metal thickness distribution.

- **Zinc metal concentration too low :**

This can be the reason for HCD burning.

- **Chloride concentration too high :**

This can lead to dissolving of metal (zinc and/or basic metal). It can also cause some brittleness.

- **Chloride concentration too low :**

This can lead to reduction in zinc metal content and a slight burn in the HCD area.

- **Boric acid (or ammonium-) concentration too high :**

This can be the reason for grey deposits and roughness in the HCD area.

- **Boric acid too low :**

This can lead to rough deposits, since a lack of boric acid causes a loss of the buffer effect in the diffusion layer during deposition.

- **pH – value too high (above 5.4)**

This can lead to burning at the HCD, a loss of zinc metal concentration and formation of metalhydroxides.

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- pH – value too low (below 4.6) :

This can lead to an increase in metallic impurities (dissolving of basis metal), a decrease in covering power and metal distribution.

15. PROBLEMS AND TROUBLE SHOOTING GUIDELINE

Metallic Impurities

The following table shows the effects of metallic impurities in acid zinc plating solutions on the deposits.

- denotes no effect.

+ denotes a negative effect.

	5 ppm	50 ppm	500 ppm
Iron	-	-	+
Copper	-	+	+
Nickel	-	-	+
Chrome	+	+	+
Lead	+	+	+
Cadmium	+	+	+
Cobalt	-	+	+

The following problems can be noticed on Hull Cell panel which should be run at 1 Ampere for 15 minutes.

HCD = High Current Density

MCD = Medium Current Density

LCD = Low Current Density

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Iron :

- 500 ppm - Brown and brittle deposits in HCD area
- Excessive basic brightener consumption.

Copper :

- 50 ppm - black edges in LCD area
500 ppm - black deposits in LCD area. HCD burn, MCD yellow and rough deposits.

Nickel :

- 500 ppm - HCD edges are burn. Loss of covering power.

Chrome:

- 5 ppm - Blue chromate turns light yellow. Slight haze in MCD.
50 ppm - Blue chromate turns yellow. Deposit brittle.
- No covering power. Skipping in LCD.
500 ppm - HCD badly burnt. MCD blistered, blue chromate dull-yellow.
- LCD grey, dull, skipping, Loss of current efficiency.

Lead:

- 5 ppm - Blue chromate shows light, yellow markings. LCD has cloudy, milky deposits.
50 ppm - Upper half of Hull Cell panel is dully-Grey. Lower half of panel has dark, rough deposits with skipping and no covering power.
500 ppm - Total Hull Cell panel is Grey, rough and dull.

Cadmium :

- 5 ppm - Blue chromate has a light yellow tinge over panel.
50 ppm - Blue chromate is milky, yellow-iridescent.
500 ppm - Zinc deposit is very dark. Loss of covering power.

Cobalt :

- 50 ppm - Increase of brightness. Loss of covering power. Grey spots in LCD area
500 ppm - Further increase in brightness. Further loss of covering power.
- Big Grey spots in LCD area.

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16. SAFETY PRECAUTIONS

HR AZn additives and plating solutions are poisonous. Necessary safety precautions should be adhered at all times.

17. GUARANTEE

Above Instruction and recommendations are the result of intensive testing and shop experiences. They are for your Information, only.

Our guarantee extends to the continuous quality of our products, as they leave our factory and not to their usage in the field, which is a factor beyond the control of a supplier.

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