

ZINCALLOY ZFE

ALKALINE ZINC/IRON

INTRODUCTION

Zincalloy ZFE is an alkaline zinc-iron alloy plating process giving exceptional corrosion resistance. Deposits have a consistent alloy of 0.3 – 0.6% iron. Zincalloy ZFE ensures excellent metal distribution, high covering power, bright finish, stress-free and ductile deposits. The process is suitable for either rack or barrel plating installations.

BENEFITS

- Stable, economical system.
- Excellent metal distribution and covering power
- Low stress deposits
- High brightness
- Easy to passivate
- Suitable for barrel and rack

SOLUTION MAKE -UP

Zinc oxide	21.6g/L
Sodium hydroxide	120g/L
Zincalloy ZFE Make Up	100ml/L
Zincalloy ZFE Brightener	8ml/L
Zincalloy ZFE Additive	1ml/L

OPERATING DATA

Zinc	17 – 22g/L
Iron	380 - 500mg/L
Sodium hydroxide	110 – 130g/L
Temperature	18 – 23°C
Cathode CD	0.5 – 3.0 asd
Anode CD	2.0 – 3.0 asd
Agitation	Solution and work movement
Plating rate	~0.24µm/min

EQUIPMENT

Tanks	Polypropylene, PVC or rubber lined steel
Heaters	PTFE or mild steel immersion with thermostatic control. Cooling may be required.
Anodes	Mild steel, in conjunction with an external zinc dissolving cell
Filtration	Continuous filtration is important in order to avoid roughness. This should be 2-3 turnovers/hr.
Extraction	Required

INSTALLATION

1. Clean the process tank with water then leach with a 50g/L solution of sodium hydroxide overnight, pumping through all filters, pumps and pipework. Pump out and rinse thoroughly with water.
2. Fill the tank approximately one quarter full with deionised water. Add the required amount of sodium hydroxide carefully with stirring.
3. While the solution is hot (80-90°C) add zinc oxide gradually and stir until dissolved. The hotter the
4. Solution the easier the dissolution.
5. Top up with deionised water to 80% of final volume.
6. Cool the solution to approximately 25°C then add the calculated quantities of Additives.
7. Make up to final volume with DI water.

MAINTENANCE AND CONTROL

The solution should be analysed regularly and replenished as necessary.
The addition rates for the additives will vary depending on the required brightness, drag-out etc, but the following can be used as a guide:-

Zincalloy ZFE Replenisher	200 – 230ml/KAhr
Zincalloy ZFE Carrier	400 – 450ml/KAhr
Zincalloy ZFE Brightener	120 – 160ml/KAhr
Zincalloy ZFE Additive	50 – 70ml/KAhr

Note Replenisher must be premixed with Carrier before adding to the tank.

NOTES OF THE USE OF ZINCALLOY ZFE

Iron: The percentage of iron incorporated into the deposit controls the corrosion resistance.

Low iron-concentration will result in a decrease of the corrosion resistance.

High iron-concentration will not passivate easily and be prone to blistering.

The iron concentration is adjusted with addition Zincalloy ZFE Replenisher.
5 ml/L Zincalloy ZFE Replenisher increases the iron concentration by 100mg/L Fe.

IMPORTANT: The iron concentration of the bath must be maintained below 650 mg/L, otherwise the corrosion resistance will be reduced

Sodium hydroxide: This maintains the bath conductivity. A concentration of 110 - 130 g/L is recommended. Too low a concentration will decrease the deposition rate and the bath conductivity.

Zincalloy ZFE Carrier: This controls the iron incorporation in the plated deposit and maintains the deposition rate. A too high concentration decreases the iron build-up.

PRODUCT FAMILIES

The following products are referred to in this data sheet.

PRODUCT NAME	PRODUCT NUMBER
Zincalloy ZFE Make Up	585012
Zincalloy ZFE Brightener	587030
Zincalloy ZFE Additive	581029
Zincalloy ZFE Carrier	585010
Zincalloy Replenisher	587029

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