

Marshal EN 832

Technical Data sheet

EN 832 is highly stable electroless nickel plating system. EN 832 is a medium Ni - phosphorus composite coating and phosphorus content is uniformly between 7 to 8 %. EN 832 produces uniform bright deposit.

EN 832 offers distinct advantages over conventional medium phosphorus plating processes;

- ❖ Faster disposition rates
- ❖ Bright , uniform deposits
- ❖ Stable formulation (even at high temperatures)

EN 832 is supplied in three liquid concentrates A,B,C. The formulation is suitable adjusted to maintain operating pH.

Replenishments

In order to achieve best performance it is necessary to maintain the constituents in operating range. The best way of replenishments is always by analysis. However the replenishments may be made by assumed deposition rate and thickness.

For every 1 sq.ft per 15 microns of deposit add;

140 ml EN 832 A
140 ml EN 832 C

Operating Parameters

Sr.	Parameter	Min	Mix
1	Ni Metal	5.2 gms/Lit	6.0 gms/Lit
2	pH	4.60	4.90
3	Temperature	85 Deg C	92 Deg C
4	Reducer	20 gms/Lit	30 gms /lit

Process parameters :

1. Phosphorus content 7 to 8 %
2. Hardness value 450 to 500 VHN
3. Speed of plating
 - a. for first 5 MTO 19 to 22 microns /hr
 - b. for balance MTO 17 to 19 microns /hr
- 4 MTO 10 (in optimum conditions)
(MTO is metal turn over, when 5.8 gm of Ni is deposited from 1lit of bath = 1 MTO)
5. Density of Deposit 8.05 to 8.15 g/cc

Control :

Since Electroless Nickel plating is influenced by pH it is mandatory to maintain the pH range. As the bath ages we recommend to keep the pH on higher side of the range.

Tanks and heating systems:

Polypropylene or PP lined SS tanks are most suitable for EN 832 process. It is recommended that double tank system is used, where outer tank is filled with water, glycol or other suitable heat transfer liquid, and outer tank is heated with an electric or steam coil heating unit. However, heating system with glass or silica with appropriate heating capacity may be used. In order to avoid decomposition of the electroless nickel bath, ensure air agitation while heaters are on. The operating solution is highly active above 70 deg C. Remove fine deposits, should it occur on the heaters by using Nitric Acid.

Filtration:

Filter used should be of all polypropylene or stainless steel construction. The unit should be thoroughly cleaned and treated with 30 % Nitric Acid and again rinsed through with water before use. If the solution is filtered at working temperature, then particular care to cleanliness is required.

Storage:

EN 832 concentrates, presents no problem under normal condition. The products should not be stored below 10 C. In the event of crystallization due to lower temperature, immerse the container in warm water. Stir the contents to ensure a homogenous mixture before use. Maximum storage temperature is 40 C.

Analytical Measures of EN 832 Bath

Estimation Of Nickel Content:

1. Take 5 mls of the bath solution.
2. Add 50 mls of distilled water plus a few drops of ammonia.
3. Add few grains of Murexide indicator.
4. Titrate using 0.10 Molar EDTA solution to purple end point.

Calculation :

$$\text{ml. titrated} * \text{M E.D.T.A.} * 11.738 = \text{g/l Ni}$$

To raise 1 gm/lit Ni add 12 ml/lit EN 832 A

Estimation Reducer:

1. Take 5 mls of the bath solution in a conical flask with stopper.
2. Add 50 mls of distilled water followed
3. Add 30 mls of 50% HCl and 50 mls 0.1N Iodine solution. (*Note It is important to be precise in Normality of Iodine Solution*)
4. Stopper the flask and leave for 30 minutes in a dark place.
5. Titrate with 0.1 N Sodium Thiosulphate, using starch indicator till colorless end point.

$$(\text{Mls of 0.1 N Iodine} - \text{mls 0.1N Sodium Thiosulphate}) \times 1.06 = \text{gms Lit Reducer}$$

Normal range should be maintained between 20 - 30 gms/lit.

To raise 1 gms/lit reducer add 1.70 ml/lit EN 832 C and 1.70 ml/lit EN 832 A (*It is important to raise Nickel metal along with Reducer to maintain the balance.*)

5.HEALTH & SAFETY:

EN 832 A concentrate is Acidic. However EN 832 B and C are alkaline, the normal precaution when handling chemicals should be followed. Do not take internally and wear face masks and protective clothing when handling them