

UNIT - XI

MAJOR DEFECTS IN PLATING

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11.1 INTRODUCTION:

In this unit you will study about some major defects in electro-plating

11.2 OBJECTIVES:

After going through this unit you will be able to:

- Explain about various defects found on plating

11.3. Major Defects in Plating

Peeling, blistering, pitting, hazing, imperfect adhesion, roughness of deposits, no deposition are some of the major defects observed in plating.

11.3.1 Causes of Defects

Imperfect composition of salt solution, contamination of salt solution, defective anodes, improper temperature of plating solution, failure to maintain acidity pH value, imperfect current density, lack of knowledge of plating time, imperfect cleaning of objects, defective electrical connections at bus-bar, anode bar or cathode bar etc.

Table 11.1 below shows various defects observed in plating, its causes and remedies.

Defects	Causes	Remedies
1. Blistering and imperfect adhesion	(i) Unbalance solution (ii) Occlusion of hydrogen during cleaning (iii) Improper cleaning	(i) Check the metal and salt solution and correct according to standard values (ii) Employ anodic cleaning (iii) Check the cleaning cycle.
2. Rough dark and granular deposits	Plating at high current densities	Reduced current density and voltage.
3. Dark put smooth deposit	Metallic contamination	Reduce anode area & check composition of salt solution.
4. Thin meagre deposits	Low conductivity	Check bath composition to increase conductivity.
5. Staining or discoloration	(i) Insufficient swilling (ii) Retention of plating solution in cavities of base metal.	Check bath composition to increase conductivity. (i) Use flowing water for final rinse. (ii) Immerse plated item in boiling water for half an hour before drying
6. Non-deposition	(i) Reverse polarity or faulty contacts (ii) Passivity of the cathode	(i) Check the electrical connections (ii) Pickle to remove scales
7. Lack of brightness	(i) Solution unbalanced (ii) Metallic contamination (iii) Low concentration of brightener	(i) Check the salt contents (ii) Remove contamination by adding required quantity of purifier. (iii) Add required quantity of Brightener.
8. Appearance of crystal on anodes and side of the tank when cold	Accumulation of carbonates over a long period of use	Crystals be removed mechanically
9. While plating the current falls and the voltage rises	Anode polarisation due to unbalanced salt solution	Check the content of the salt solution and make up the deficiency.

11.4 EMBOSSING PROCESS

Embossing process is a process of controlled dissolution of material by an etchant solution.

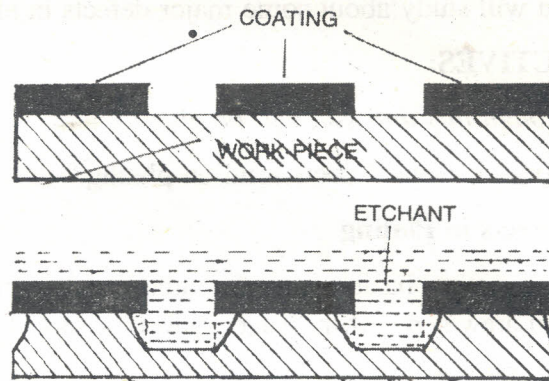


Fig. 1 Principle of Chemical etching/embossing.

The material is removed by chemical action in the form of metallic salt. The parts through which no metal is removed is coated with a protective etchant resistant layer made of rubber, plastic or some proprietary compound.

Commonly used etchants solutions are caustic and acid solutions such as Ferric chloride, hydrochloric acids etc., for etching aluminium for steel and nickel, chromic acid and ammonium persulphate is used for etching copper.

11.5 WHAT YOU HAVE LEARNT

In this unit you have learnt about

- major defects found in plating
- Embossing process

11.6 TERMINAL QUESTIONS

Q.1 What are major defects in plating? How these could be eliminated?

Q.2 Describe briefly about any three major defects in plating?