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LEN-133 System

Electroless Nickel

LEN 133 deposits have a nickel-phosphorous alloy that is deposited by means of an autocatalytic reduction of metal from solution without the use of electricity. LEN 133 coatings are noted for the following properties: Coating is uniform at a consistent, rapid rate, bright Electroless Nickel process with mid (6-9%) phosphorous content.

Advantages

- Stable, uniform rate of .0006 - .0008.
- 8-10 metal turnovers.
- No staining (yellow, brown or black).
- Excellent wear resistance, freedom from porosity on thickness of .001.
- Constant, quality brightness throughout the life of the bath.
- High tank stability.
- Deposit not tensile, ductile.
- Natural lubricity, providing excellent release properties.
- Self-polishing effect in molding operations.
- 6-9% phosphorous as plated.
- Easily waste treatable.

Deposit Properties:

Phosphorous Content	6-9 wt. %
Hardness	48-52 Rc as plated
Internal Stress	Compressive
Ductility	Pass (ASTM B-489)
Electrical Resistivity	70-100 microohm-cm
Melting Point	880° C
Density	7.75 g/cc

Operating Data:

LEN 133 S	Bath make-up solution
LEN 133 N	Nickel replenisher
LEN 133 H	Hypophosphite replenisher with ammonia
LEN 133 DH	Double concentration hypophosphite replenisher with ammonia (Replenishment ratios should be adjusted accordingly to the increase in strength.)

Operating Instructions

1. A new bath should be made with 20 parts LEN 133 S and 80 parts DI water. Tanks should be previously calibrated to assure proper concentration. Tanks may now be half filled with DI water. LEN 133 make up is added with agitation on. DI water is then added to bring the solution to the proper level. **Always use DI water to start or replenish bath.**
2. pH should now be checked and adjusted to 4.8 with Aqua Ammonia if necessary. Always dilute ammonia 1:1 with DI water before adding. The same dilution applies to sulfuric acid if the pH ever needs to be brought below 5.0. The proper operating range is 4.6 to 4.8.
3. Air must be turned on before turning on heat.
4. Filter should be turned on and remain on throughout the operation period.
5. The bath is heated to a range of 186-192° F, with an optimum target of 188° F for normal operation. Making sure the heater thermostat is in the bath. Do not exceed 195° F.
6. Titration of bath should be used on the amount of work being processed.
7. Operation range of nickel content should be maintained between 85-90%.
8. Replenishment adds may be made during plating at a ration of 1N: 2H. LEN 133 N is always added before LEN 133 H (DH). Replenishment should be made in 10%, **never more than 15%**, increments to eliminate possible over-concentration of the bath.
9. Bath pH is self-maintained by proper replenishment. If, however, the pH varies form the operation range due to excessive drag-in, it may be adjusted by following instructions in step #2. Dilution of this type of add with DI water is a must at operating temperature.