

E-Brite 700-SB

Semi-Bright Nickel Plating Process

E-Brite 700 SB process is formulated to meet the requirements for Duplex Nickel. The breakdown products require less carbon treatment. The plating process produces a deposit with a high degree of leveling and ductility plus low electro-negative potential. In most cases only one additive for maintenance is necessary after make up.

SOLUTION MAKE-UP

Material	Range	Optimum
Nickel Sulfate (NiSO ₄ · 6H ₂ O)*	36-50 oz/gal (270-375 g/l)	40 oz/gal (300 g/l)
Nickel Chloride (NiCl ₂ · 6H ₂ O)*	4.5-6.0 oz/gal (34-45 g/l)	5.5 oz/gal (42 g/l)
Boric Acid (H ₃ BO ₃)	5.0-6.5 oz/gal (38-50 g/l)	6 oz/gal (45 g/l)
E-Brite 700-SB-Make-Up**	0.75-1.25%/vol (7.5-12.5 ml/l)	1%/vol (10 ml/l)
E-Brite 700-SB-B	3-5 qts/1000 gals (.75-1.25 ml/l)	4 qts/1000 gals (1 ml/l)
E-Wet 701-W Air or 702-W BBL	0.1-0.4%/vol (1-4 ml/l)	0.25%/vol (2.5 ml/l)

OPERATING CONDITIONS

pH	3.8 – 4.5	4.2
Temperature	120-150°F (50-65°C)*	140°F (60°C)
Average Current Density	20 – 70 ASF (2-7 asd)*	40 ASF (4 asd)
Agitation	Air agitation required.	

* Complex shaped parts may require higher nickel concentrations and/or temperatures and/or the use of lower cathode current densities.

** **E-Brite 700 SB Make-Up** is normally required only at the time of solution make up, conversion or subsequent to carbon treatment.

FUNCTION/CONTROL OF CONSTITUENTS

General

Optimum performance will be realized when bath constituents and operating conditions are operated at optimum. Additions made frequently will produce best results. All materials used for the plating bath should be of good plating quality.

Nickel Sulfate

The nickel sulfate concentration contributes the nickel metal necessary to provide the latitude for the operating current density range. Complex shapes and/or the use of higher current densities should have the highest nickel sulfate concentration. Nickel sulfate should be maintained on the basis of regular analysis.

Nickel Chloride

The nickel chloride concentration primarily contributes the chloride ion for proper anode corrosion, good bath conductivity and for improving the limiting current density. Concentrations higher than those recommended may be used but may pose equipment corrosion problems and/or reduced ductility. Nickel chloride should be maintained on the basis of regular analysis.

Boric Acid

The boric acid concentration contributes the cathode film buffering necessary for the bath to produce deposits with good ductility, brightness, leveling and limiting current density. Concentrations greater than those recommended may produce clogged air pipes, deposit roughness, etc. due to the lower solubility of boric acid.

E-Brite 700 SB Make Up

Make-Up is used at the time of make-up of the solution and it should not be necessary to replenish this material except under unusual circumstances such as high drag-out and/or high current concentrations. Additions after make-up should be based on supplier recommendations. **E-Brite 700 SB Make-Up** operates with the **E-Brite 700 SB-B** to produce good leveling and ductility. High concentrations of **E-Brite 700 SB Make-Up** will reduce leveling and dull the deposit. Low concentrations of it will tend to reduce ductility.

E-Brite 700 SB-B

E-Brite 700 SB-B is the primary additive and produces the semibright color and leveling properties of the deposit. High concentrations of **E-Brite 700 SB-B** will increase brightness/leveling but also decrease ductility. The correct concentration produces a definite semibright color in the deposit. Low concentrations of **E-Brite 700 SB-B** will produce duller and less levelled deposits.

E-Wet 701-W Air or 702-W BBL

Use of a small amount of anti-pitter in the solution will aid in preventing gas pitting of the deposit under most conditions. Concentration of about 0.1% - 0.2%/vol (1-2 ml/l) should be satisfactory in most circumstances. High concentrations of **E-Wet 701-W Air or 702-W BBL** not will produce harmful results except for possible drying of the deposit during transfer.

pH

The **E-Brite 700 SB** process will function over a wide pH range, but best results will be obtained within the range 4.0-4.5. Many metallic impurities will precipitate within this range and will be removed by the filter on a continuous basis (e.g. Fe^{+3} , Al , Si , Cr^{+3}).

The pH will rise during normal operation of the bath. Dilute (10%) Sulfuric Acid of an acceptable grade should be used to adjust pH.

Temperature

The **E-Brite 700 SB** process can be operated over a wide temperature range, however, it is recommended that a relatively narrow range be selected and adhered to. Wide fluctuations in temperature will affect the current being drawn at a given voltage setting and can result in either poor performance or uneconomical operation.

Agitation

Air agitation from a low pressure blower is preferred. Parameters for construction of a suitable air agitation supply system are available.

Current Density

Cathode Current Density

The **E-Brite 700 SB** process operates over a wide range of cathode current densities; however, an average current density of 30-40 ASF (3-4 asd) should prove adequate for most cases.

Anode Current Density

Sufficient anode area should be provided to produce a maximum anode current density of about 30 ASF (3 asd) for air agitated solutions and 18 ASF (1.8 asd) for mechanically agitated solutions. Insufficient anode area may lead to anode polarization which, in turn, will produce poor deposits due to low thickness, high addition agent consumption, etc.

Anodes

Electrolytic squares, R-rounds*, or S-rounds* used in titanium baskets are preferred for use. See "Anode Current Density" above. Baskets should be filled on a regular basis to assure maximum anode area.

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Anode Bags

Double cotton, cotton flannel or napped polypropylene anode bags are preferred. Cotton bags should be leached, before use, in 5% Sulfuric Acid solution containing 0.1% of the antipitter used. Polypropylene bags should be laundered and rinsed thoroughly using conventional laundry procedures and detergent.

Equipment

Tanks

Tanks should be lined with a suitable synthetic material, such as PVC, which will withstand the temperatures expected. New tanks and liners should be leached overnight with 1-2% by volume Sulfuric Acid heated to 140°F.

Filtration

Filtration is strongly recommended. The filter should have at least one square foot of surface area for each 100 gallons of solution. The pump should be capable of turning the solution over at least every hour for air agitated solutions.

Packaging

Five (5), and 55 gallon non-returnable containers.

IMPORTANT NOTICE! For Industrial Use Only

The following is made in lieu of all warranties, expressed or implied, including warranties of merchantability and fitness for purpose: seller's and manufacturer's only obligation shall be to replace such quantity of the product as proved to be defective. Before using, user shall determine the suitability of the product for its intended use, and user assumes all risk and liability whatsoever in connection therewith. **Neither seller nor manufacturer shall be liable either in tort or in contract for any loss or damage, direct, incidental or consequential arising out of the use or the inability to use the product.**

9/29/06