



ENBRITE QUASAR ENS

- ***Excellent bath stability.***
- ***High tolerance to impurities.***
- ***Long bath life.***
- ***Additions can be made at operating temperatures.***
- ***Excellent as a strike on zincated aluminum.***
- ***RoHS compliant chemistry.***
- ***Easy bath control and replenishment.***

ALKALINE ELECTROLESS NICKEL STRIKE

QUASAR ENS is an easy to use electroless nickel process specifically formulated to provide an insoluble barrier deposit onto zincated aluminum and zinc die cast prior to electroless nickel plating.

QUASAR ENS will significantly extend the bath life of any electroless nickel plating solution while eliminating the concern of blistering or poor adhesion.

QUASAR ENS offers high tolerance for zinc metal and deposits such a thin coating that it has a very long operating life. At elevated temperatures it can be used to plate directly onto zinc die cast.

QUASAR ENS offers RoHS compliant electroless nickel chemistry that is easy to control and replenish.

OPERATING DATA

	<u>Range</u>	<u>Optimum</u> <i>18%/vol.</i>
QUASAR ENS-A		
QUASAR ENS-B		6%/vol.
Nickel Metal	0.65-0.85 opg	0.80 opg
Hypophosphite	3.2-4.5 opg	4 opg
pH	8.5-11.5	10.0
Temperature	90-120° F (32-49° C)	110° F (43° C)
Bath loading	0.1-1.5 ft ² /gal	0.50 ft ² /gal
Activity	Maintain between 85-100%	
Plating rate	0.1-0.2 mils/hour	
Time	3-5 minutes	

DEPOSIT PROPERTIES

Nickel Content	96-99% w/w
Phosphorus Content	2-4% w/w
Melting Point	1050-1200 ° C
Hardness	60-62 R as plated 68 R (400 F ° 4 hrs)
Density	8.5-8.6 g/cc
Magnetic	magnetic
Electrical Resistivity	20-30 μ ohm/cm
Ductility	Passes (ASTM B-489)

PROCESS ADDITIVES

The **QUASAR ENS PROCESS** consists of the following additives;

- | | |
|----------------------|---|
| QUASAR ENS-A | Make-up and replenishment, green/blue material. |
| QUASAR ENS-B | Make-up component and replenishment, clear color. |
| QUASAR ENS-CM | Replenishment only, green material. |

SOLUTION CONTROL

For best results, bath replenishment should be maintained by nickel metal analysis. Optimum nickel metal concentration is 0.8 opg via **QUASAR ENS-B-1** and **QUASAR ENS-CM**, added at a 1:2 ratio.

Nickel Metal Analysis

1. Pipette 10 ml sample of bath into a 250 ml Erlenmeyer flask.
2. Add 50 ml of DI water.
3. Add 5 ml of concentrated ammonium hydroxide to form a light blue solution.
4. Add a pinch of Murexide Indicator.
5. Titrate with 0.0575 EDTA to a violet (magenta) endpoint.

Calculation: Mls of 0.575 EDTA x 0.045 = opg nickel metal.

For every 0.1 opg low of nickel metal add 2.0 fl.oz./gal of **QUASAR ENS-CM slowly with agitation.**

Hypophosphite Analysis

1. Pipette 5 ml sample of room temperature bath into Iodine glass flask.
2. Add 50 ml DI water.
3. Add 30 ml of 6N hydrochloric acid.
4. Add 50 ml of 0.1N Iodine Solution.
5. Stopper flask and swirl to ensure mixing. Remove to a dark area for 35 minutes.
6. Remove stopper and rinse flask neck with DI water.
7. Titrate immediately with 0.1N Sodium Thiosulfate to a colorless endpoint.

Calculation:

$[(\text{ml } 0.1\text{N Iodine}) - (\text{ml } 0.1\text{N Sodium Thiosulfate})] \times 0.141 = \text{opg} (\times 1.06 = \text{g/l}) \text{ sodium hypophosphite.}$

* **Optimum concentration is 4 opg.**

For every 0.1 opg of Sodium Hypophosphite low, add 0.2 fl. oz./gal of **QUASAR ENS-B.**

REPLENISHMENT CHART PER 100 GALLONS

ML 0.0575 EDTA	Nickel Concentration OPG	QUASAR ENS-B (mls)	QUASAR ENS-CM (mls)
17.8	0.80	0	0
16.9	0.76	1160	2320
16.0	0.72	2270	6760
15.1	0.68	3380	8990
14.2	0.64	4495	11200
13.3	0.60	5600	11200

EQUIPMENT

Tank

An anodically passivated stainless steel tank or high density polypropylene tank is recommended.

Heaters

Heaters should be 316 stainless steel derated (low density) electric or Teflon steam coils.

Ventilation

Ventilation equipment is recommended to remove the steam vapors that are produced from the bath. This equipment is available from **A BRITE**.

Filtration

Filtration is not necessary but always improves performance of a bath. Continuous filtration through a 5 micron or smaller media may be utilized. A drip bag filter or tube filter is satisfactory. The filter should be changed frequently if running multiple production shifts. The filter should be sized to turn the solution over at least 3-4 times per hour. Filter and hoses should be constructed of materials that are suitable for use with electroless nickel plating solutions. **A BRITE** can assist in the proper sizing as well as supply any filter and filter media requirements.

Agitation

Low pressure air supplied by a blower is recommended. Compressed air *is not satisfactory*, due to the introducing of oil to the nickel solution, no matter how many "filters" are installed on the line. The volume of air should be sufficient to provide uniform movement of the solution throughout the tank. If mechanical agitation is utilized, movement of the cathodes rod should be 3-9 feet per minute. **A BRITE** can supply specific information and diagrams on the proper design and materials required to build a professional air distribution system.

pH CONTROL

Under normal operating conditions, **QUASAR ENS** does not require any additional pH adjustments. However, adjustments can be made with 50% Ammonium Hydroxide or with **QUASAR HpH** for an ammonium free system. To lower pH, use 25% reagent grade Sulfuric Acid. All additions should be made very slowly with agitation and with no work in the tank.

STORAGE/HANDLING

QUASAR ENS PROCESS additives are stable and have excellent shelf life. Store in a dry area in closed containers. It is not combustible.

The maintenance and disposal of **QUASAR ENS** solutions requires the handling of slightly acidic nickel bearing industrial chemicals. Do not take internally. Avoid prolonged contact with the skin. Avoid contact with the eyes. Wear proper protective clothing and safety gear. **Refer to the Material Safety Data Sheet for more specific information before using this product.**

WARRANTY

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