



Product Bulletin

Better Chemistry. **Better Business.**

Enerox™ Nickel Additive C 9

Product Code: 2850003
Revised Date: 02/22/2007

Enerox™ Nickel Additive C 9 Carrier/ Stress Reliever

Enerox™ Nickel Additive C 9 is a product used in the Enerox™ nickel systems. Enerox™ Nickel Additive C 9 maintains ductility of the nickel deposit. It is also a class I or primary brightener, enhancing the overall desired nickel deposit characteristics (brightness & leveling). Enerox™ Nickel Additive C 9 is readily used in rack, barrel, reel to reel (continuous strip) nickel plating applications.

SPECIAL FEATURES

- Maintains Excellent Ductility of the Nickel Deposit
- Improves High Current Density Brightness
- Complements the Enerox™ Bright Nickel System Performance
- Economical Consumption Rate
- Carbon Filtration Tolerant
- Compatible With Most Bright Nickel Systems

RECOMMENDED APPLICATION

	Range	Optimum
Concentration	3 – 5.5% v/v	4% v/v
Nickel Bath Temperature	130 – 150 deg F (54-66 deg C)	140 deg F (60 deg C)
Nickel Bath pH	3.5 – 4.5	4.0
Nickel Bath Agitation	Air or Mechanical	As required

Note: Your Hubbard-Hall Sales Representative or the Corporate Technical Center will be pleased to recommend the optimum conditions for the particular nickel plating application.



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ANALYSIS PROCEDURE NICKEL PLATING SOLUTION

The routine procedure should include wet analysis of the plating salts, bath pH, and a plating cell test. The Corporate Technical Center can provide the analysis procedures, along with the required solutions, labware, and testing equipment. Hull cell testing is a reliable method for determining overall condition of the nickel deposit. Unless there is a specific ductility evaluation, a simple bend test of the high current density (or horizontally across the plated panel) is normally sufficient. Additions of Enerox™ Nickel Additive C 9, as required, should be made to the hull cell in 0.5% by volume increments. Improved or preferred ductility should be achieved, with the bath analysis in range, at the operating parameters.

PROCESS SUGGESTIONS

Enerox™ Nickel Additive C 9 is a multifunctional additive. It is the stress reliever, ductilizing agent, and class I brightener. Enerox™ Nickel Additive C 9 is consumed by electrolysis at the rate of one gallon per 18,000 to 25,000 amp hours (5 to 7 fl oz per 1,000 amp hours). Enerox™ Nickel Additive C 9 is removed, to some degree, by batch carbon treatment. Continuous filtration of the nickel bath through a carbon pack removes only a slight amount of Enerox™ Nickel Additive C 9. Additions (If Enerox™ Nickel Additive C 9 can be made directly to the nickel bath, as required,) in conjunction with the specific Enerox™ Bright Nickel process additives.

PHYSICAL CHARACTERISTICS

Appearance	Clear colorless liquid
Odor	None
Foaming Tendency	None
Maximum Solubility	Complete

HAZARD CLASSIFICATION

DOT Hazard Class	Not Applicable
DOT Shipping Name	Not Applicable
UN Number	Not Applicable
Packing Group	Not Applicable
Guide Number	Not Applicable

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WASTE TREATMENT & DISPOSAL

The nickel plating solution is mildly acidic. Sources for treatment, such as drag out losses and batch purification, should be processed in accordance with appropriate steps, to meet local POTW or municipal effluent discharge requirements. Sludges should be separated out before discharge. Mixed solutions of nickel effluent and other plant waters may require additional treatment to meet discharge requirements.

WARRANTY

THE QUALITY OF THIS PRODUCT IS GUARANTEED ON SHIPMENT FROM OUR PLANT. IF THE USE RECOMMENDATIONS ARE FOLLOWED, DESIRED RESULTS WILL BE OBTAINED. SINCE THE USE OF OUR PRODUCTS IS BEYOND OUR CONTROL, NO GUARANTEE EXPRESSED OR IMPLIED IS MADE AS TO THE EFFECTS OF SUCH USE, OR THE RESULTS TO BE OBTAINED.