

## ***Aero<sup>2</sup>-NiEX Nickel Infused Actuators***

The *Aero<sup>2</sup>-NiEX* is a unique nickel infused actuator that employs an Autocatalytic Nickel Infusion (ACNi) process to deliver a uniquely effective corrosion resistant actuator for use in aggressive environments, under high humidity and in application areas where an attractive long-lasting surface finish is desirable.

### **Q What is NiEX?**

An Autocatalytic Nickel Infusion process that does not require rectifiers, electrical currents or anodes as in electroplating processes.

### **Q What is so unique in the NiEX Actuator?**

The Nickel bath makes it possible to uniformly treat all internal and external surfaces of the actuator cylinder housing and other treated components. The uniformity of a deposit thickness is extremely difficult by any other methods currently available.

Since all surfaces are wetted by the solution the deposit thickness is uniform and controlled to within one (1) micron.

### **Q What is a 'Nickle Bath'?**

The nickel bath is a dense alloy of both nickel and phosphorous. The amount of phosphorous varies depending upon the formulation of the bath solution.

The deposition process is autocatalytic.

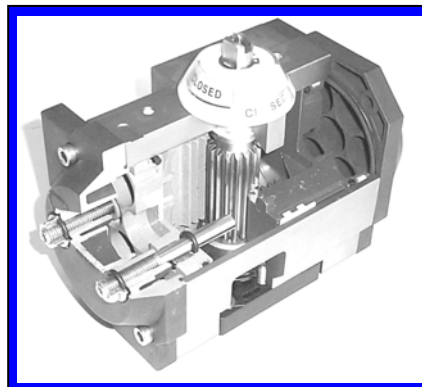
### **Q What is the 'Autocatalytic' process?**

In the deposition process once the primary layer of nickel has formed on the substrate, that layer and each subsequent layer becomes the catalyst that causes the continuous reactions that result in the 'uniform' thickness required.

### **Q What criteria were used to develop the NiEX actuator?**

*SVF Flow Controls, Inc.* is a leader in innovative process solutions. Our customer base includes many of the largest companies on the world market today. These clients have provided us with their "wish list" of performance and appearance parameters. The result is this *Aero<sup>2</sup>-NiEX* actuator. The criteria included:

- Corrosion resistance
- Wear resistance
- Hardness
- Lubricity
- Uniformity of deposit regardless of geometrics
- Non-magnetic properties of phosphorous nickel alloy
- No sparking properties
- Nickel density surface finish averages Ra 10
- Appealing "Silver-Nickel" and long-lasting surface finish



**NiEX Chemical Resistance Chart (Autocatalytic Nickel Infusion)**
**A = Excellent    B = Good    C = Fair    D = Poor**

B	Acetic Acid	A	Maleic Acid
A/B	Acetone	A	Magnesium Carbonate
C/D	Alum Chloride	B	Magnesium Chloride
	Alum Potassium	B	Magnesium Sulphate
C	Sulphate	D	Mercuric Chloride
A	Alcohol Amyl	B	Mercurous Chloride
A	Alcohol Ethyl	A	Mercury
A	Alcohol Methyl	B	Methyl Chloride
B	Aluminium Sulphate	A	Methyl Ethyl Ketone
A	Ammonia	A	Methylamyl Alcohol
A	Ammonia Liquid	B	Naphta
A	Ammonium Aqueous	B	Nickel Chloride
B	Ammonium Bicarbonate	B	Nickel Sulphate
B	Ammonium Carbonate	B/C	Nitriding Gases
B	Ammonium Chloride	A	Oils (Petroleum)
B	Ammonium Nitrate	B	Oxalic Acids
B	Ammonium Sulphate	A	Perchloric Acid
B/C	Aniline Sulphate	A	Petrol
B	Barium Hydroxide	B/C	Phosphoric Acid
A	Beer	B/C	Phthalic Anhydride
A	Benzaldehyde Benzene	B/C	Pickling Acids
B	Benzene Sulphonic Acid	B	Picric Acid
D	Benzoic Acid	A	Potassium Bicarbonate
A	Black Liquor (Paper)	B	Potassium Carbonate
A	Borax	B	Potassium Dichromate
B	Bromine Water	B	Potassium Ferrocyanide
A	Butanol		Potassium Fluoride
B	Butyric Acid	A	Potassium Hydroxide
B	Calcium Chlorate	A	Potassium Nitrate
B	Calcium Chloride		Potassium Peroxide



B	Calcium Hydroxide	B	Potassium Permanganate
B	Calcium Hypochlorite		Potassium Persulphate
B	Calcium Sulphate	B	Potassium Sulphate
A	Carbon Dioxide	C	Potassium Chloride
A	Carbon Tetrachloride		Propionic Acid
A	Castor Oil		Propylene Glycol
A	Caustic Soda	B	Rayon Spin Liquor
B	Chloric Soda	A	Salt Brine
B/C	Chlorine Water	A	Silver Nitrate
B	Chloroacetic Acid	A	Soaps
A	Chloroform	B	Sodium Acetate
B	Chlorosulphonic Acid	B	Sodium Bicarbonate
A	Citric Acid	A	Sodium Bisulphate
B	Copper Chloride	A	Sodium Bisulphite
A	Copper Cyanide	B	Sodium Bromide
B	Copper Sulphate	B	Sodium Carbonate
B	Corn Oil	A	Sodium Chloride (Salt)
B	Cottonseed Oil	A	Sodium Cyanide
B	Cresylic Acid	B	Sodium Ferrocyanide
A	Crude Oil (Sour)	B	Sodium Fluoride
B	Dextrose	A	Sodium Hydroxide
A	Dinitrobenzene	A	Sodium Hydroxide (45%)
B	Ethyl Acetate	A	Sodium Hydroxide (50%)
A	Ethyl Alcohol	B	Sodium Nitrate
A/B	Ethyl Chloride	A	Sodium Nitrite
A	Ethylene Chlorohydrin	B	Sodium Sulphate
B	Ethylene Dichloride	B	Sodium Sulphide
B	Ethylene Glycol	A	Sodium Sulphite
B	Fatty Acids	B	Stannic Chloride
D	Ferric Chloride		Stannos Chloride
C	Ferric Nitrate	B	Stearic Acid
B	Ferric Sulphate	D	Succinic Acid
D	Ferrous Chloride	A	Sugar
B	Ferrous Sulphate	B	Sulphate Liquors
B	Fluosilicic Acid	B	Sulphite Liquors (Papers)

B/C	Formaldehyde	A/B	Sulphur Dioxide
C	Formic Acid	A	Sulphide Trioxide
A/B	Freon	C	Sulphuric Acid (50%)
A	Glycerine	C	Sulphuric Acid (60%)
A	Glycol	C	Sulphuric Acid (10%)
B/C	Green Liquor (Paper)	B	Tannic Acid
B/C	Gold Plating Cyanide	A	Tolvene
	Hydrobonic Acid	D	Trichloroacetic Acid
D	Hydrochloric Acid	B	Trichloroethylene
B	Hydrochloric Acid (5%)		Trisodium Phosphate
D	Hydrochloric Acid (2%)	B	Urea
A	Hydrocyanic Acid	A	Vinegar (10%Acetic Acid)
A	Hydrofluoric Acid	A	Water (Potable)
A	Hydraulic Fluid Oils	A	Water (Demineralised)
A/B	Hydrogen	A	Water (Salt)
	Hydrogen Chloride	A	White Liquor (Paper)
	Anhydrous	A	Wine
	Hydrogen Fluoride	A	Xylene
	Anhydrous	B	Zinc Chloride
A	Hydrogen Sulphide	B	Zinc Sulphate (Plating Acid)
A	Hypo (Photographic)		
A	Isopropyl Alcohol		
A	Jet Fuel		
A	Kerosene		
A	Ketchup		
A/B	Lactic Acid		

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