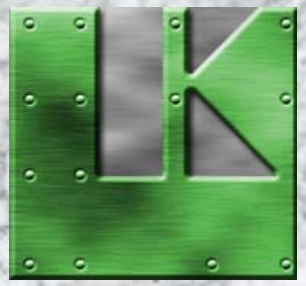
www.lekem.com

Welcome to the LeKem Difference

“Evolution is not a force, but a process.”

That's the philosophy that has made LeKem a leader in the metal finishing field. Clear vision of the future is necessary to continue the advance of the world's producing industries. Through continuous innovations and the highest standards, LeKem of Indiana, Inc., has spent nearly a quarter century developing and refining formulas to maximize efficiency and performance. At LeKem, this timely process has helped evolve a superior product. It's very simple, downtime increases profitability for us, as well as our customers.



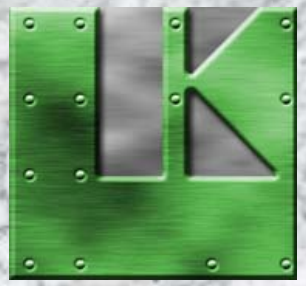
About LeKem

Located in Batesville, Indiana, LeKem manufactures Electroless Nickel and Nickel Sulfate. The pure nickel used in production reduces impurities from the bath, and results in consistent performance. Service and reliability, that's the LeKem difference.

We as well as our customers are proud of our chemical surface products and the quality they represent. The LeKem process provides a variety of choices in premium Electroless Nickel technology. Not all applications are the same, from decorative to functional finishes. LeKem has the technology that will fit your application. Our plating customers can rely on our bath as well as our technical assistance, and our reputation is growing. We focus on bringing our customers up-to-date technology and performance of their products and equipment. Once assessed LeKem brings significant cost savings, along with a knowledgeable service staff and a 24-hour help line.

LeKem's Qualifications

- Approved to replace Stainless Steel in Hospital Bed market.
- Approved in Nuclear waste holding systems.
- Approved in Aerospace and SAE.
- Approved for Oil patch and down hole tools.
- Approved for FDA.
- Approved for all ASTM Electroless Nickel specs.
- Approved to replace Chrome Plating with heat-treating.
- Approved for all ELV, RoHS,and WEEE specs.



Electroless Nickel and its Applications

Electroless Nickel is an autocatalytic chemical reduction process. This means there is no use of current or “throwing” of particles to deposit nickel on the substrate. Electroless Nickel plates perfectly even and will plate any recess or “ID or OD” of the substrate.

Electroless Nickel is controlled by three basic properties, chemical makeup, pH and temperature. All three components determine what quality of deposit is being plated to the substrate.

The 3 basic types of Electroless Nickel

Low Phosphorus 4-6% 58 Rockwell
This is used mainly for wear and not corrosion. This product is in tension and will have micro cracks on the surface.

Medium Phosphorus 6-9% 48-52 Rockwell
This is the most commonly used Electroless Nickel on the market and and has a bright deposit. Medium phosphorus has limited corrosion properties but still has micro cracks. This product is widely used mainly for aesthetics and can easily be stripped off. Medium Phosphorus Electroless Nickel can be heat treated to achieve 65-72 Rockwell.

High Phosphorus 9-13% 48-52 Rockwell
This is the best application for corrosive prevention. High phosphorous EN, when applied correctly, can achieve 200 plus hours in a salt spray chamber. This is achieved by a homogeneous and amorphous deposit on the substrate. High phosphorus Electroless Nickel is also in compression and will have superior adhesion properties. High Phosphorus Electroless Nickel can be heat treated to achieve 65-72 Rockwell.

Advantages of LeKem's Methodologies

- LeKem products were designed in a "real world" plating line over 20 years ago.
- LeKem will specially formulate for all customers and not just mass-produce one product.
- LeKem has 30 plus years of metal finishing knowledge and experience to bring to your table.
- LeKem will work with your company to save 15-30% in production and chemical costs.
- LeKem's superior products will increase your market share.

Advantages of LeKem's Products

- Constant innovation and adaptation to the current market.
- All proprietary formulas have a proven track record in the metal finishing field.
- All formulas have an organic base and are low in heavy metals.
- If operated correctly, LeKem's products do not exhibit yellow or brown staining.
- LeKem products at high thickness will not exhibit pitting or roughness
- LeKem products run at a proper pH and will never white-out.
- LeKem's products exhibit superior adhesion qualities by holding compression throughout the life of the bath.
- LeKem can achieve higher turnovers and save your company money on makeup and waste.

Advantages of LeKem's Products (cont'd)

- LeKem can has higher plating rates throughout the life of the bath to increase downtime.
- LeKem's high phosphorous is speced for all down hole tools for the oil industry.
- LeKem is able to replace stainless steel with Electroless Nickel.
- LeKem can achieve over 500 hours for the ASTM B117 salt spray test.
- LeKem has a proven track record for Aerospace and all ASTM Electroless Nickel specs.
- LeKem is approved by major fortune 500 hundred companies for Electroless Nickel.
- LeKem can design and build Electroless Nickel lines to meet customer needs.
- LeKem has a 24-hour technical assistance line.

Letter of Reference from Halliburton Oil

May 4, 2005

To Whom It May Concern:

With my current experience level with LeKem of Indiana, there have been some positive results. If properly operated and controlled their Electroless Nickel chemistry can be problem free and bring about significant cost savings. The satisfaction in the field thus far has been very positive as well.

The following benefits have held true thus far:

1. Superior adhesion in comparisons to other vendors we have used
2. Superior corrosion results in our salt spray chamber
3. Stable uniform rate
4. Higher turnovers
5. No pitting or staining
6. Increased production
7. Custom bath for our process
8. Service and technical support have been superior to other EN vendors

LeKem's Electroless Nickel has shown excellent plating qualities.

Sincerely,

Tony Valencia
Sr. Mechanical Technologist
MTTTCP Sustaining Engineering
Duncan Manufacturing Center
Phone: 580-251-2131

HALLIBURTON

Letter of Reference from Hill-Rom

Hill-Rom®
A HILLENBRAND INDUSTRY

February 22, 2007

To Whom It May Concern:

In the 1990s, Lekem of Indiana, Inc., approached Hill-Rom, a Hillenbrand Industry, one of the top manufactures of hospital beds and equipment. Lekem came with the idea that Hill-Rom could replace stainless steel with carbon steel and a high phosphorous Electroless Nickel. After testing and approval, Lekem of Indiana set out to build a quarter million dollar Electroless Nickel line. After Installation and a training course directed by Lekem Hill-Rom started running a high phosphorous Electroless Nickel the LEN-600 bath to replace stainless steel.

Since 1992 LeKem's product LEN-600 has exhibited the following.

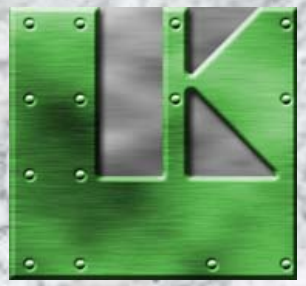
- Consistent Quality of coating for 14 years
- Consistent plating Rate for 14 years
- 8 generations in compression with a homogenous and amorphous deposit
- 100 hour salt spray at .0004 thick unsurpassed by any competitor
- No field failures in 14 years
- Saved Hill-Rom millions by using LeKem's LEN-600 bath
- Passed all stringent FDA approval tests
- Up to 10,000 parts a day with 3 shifts with no problems
- Unsurpassed technical service and just in time delivery
- Reject rate is less than 1000 parts per million
- A multitude of competitors have been tested and failed to compete with the LEN-600 system
- Competitive prices and the willingness to work with Hill-Rom on ways to save money in an ever changing market

Lekem of Indiana, Inc., is a preferred vendor of Hill-Rom and has an impeccable track record of 14 years. This letter endorses the ability of Lekem to setup a company to replace stainless steel with a high production, Electroless Nickel plating line with the LEN-600 process.

Very truly yours,

Jim Drockelman
Plant Manager

JD/jb



What You Should Know About Corrosion

EFFECT OF DEPOSIT COMPOSITION AND QUALITY ON CORROSION OF ELECTROLESS NICKEL COATINGS

The corrosion resistance of an Electroless Nickel coating is a function of two factors, alloy passivity and deposit quality. Passivity is an electrochemical term, which describes a metal's or alloy's loss of chemical reactivity (it's reduced corrosion) under specific environmental conditions. This is normally due to the formation of a protective film only a few atoms thick on the surface of the metal.

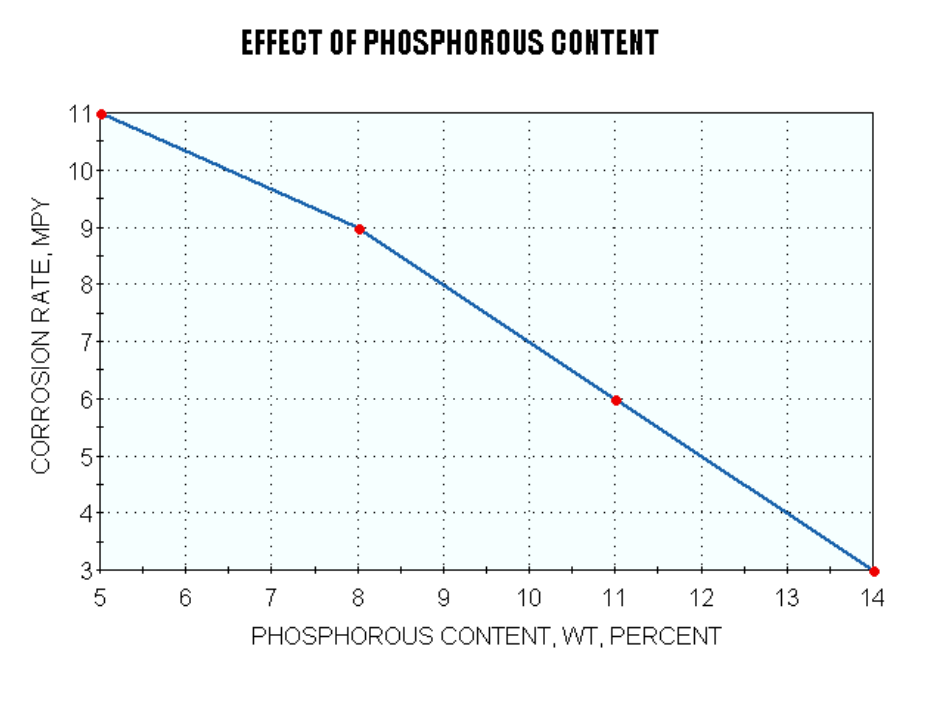
Whether a metal is passive, and the degree of its passivity, is a function of the metal's composition and it's environment. For example, Type 300 stainless steels are passive and do not appreciably corrode in oxidizing media such as nitric acid or aerated seawater.

If, however, these stainless steels are placed in a reducing environment, such as hydrochloric acid or de-aerated seawater, they will be rapidly attacked.

ALLOY PASSIVITY

Most Electroless Nickel coatings display natural passivity and are very resistant to reducing neutral, and most oxidizing environments. Their degree of passivity, however, is greatly affected by their phosphorous content; higher phosphorous alloys, like LeKem, are more easily passivated and are more corrosion resistant than those with lower phosphorous concentration. This is illustrated by the graph, which compares the corrosion experienced by Electroless Nickel coatings containing 4 ½ to 10 ½ percent phosphorous in aerated citric acid at 122 degrees Fahrenheit.

In this test, corrosion of the 10 ½ percent phosphorous Electroless Nickel was only about one half of that of lower phosphorous coatings. Unfortunately, most of the Electroless Nickel sold today is of the latter type, and typically contains only 7 to 9 percent phosphorous.



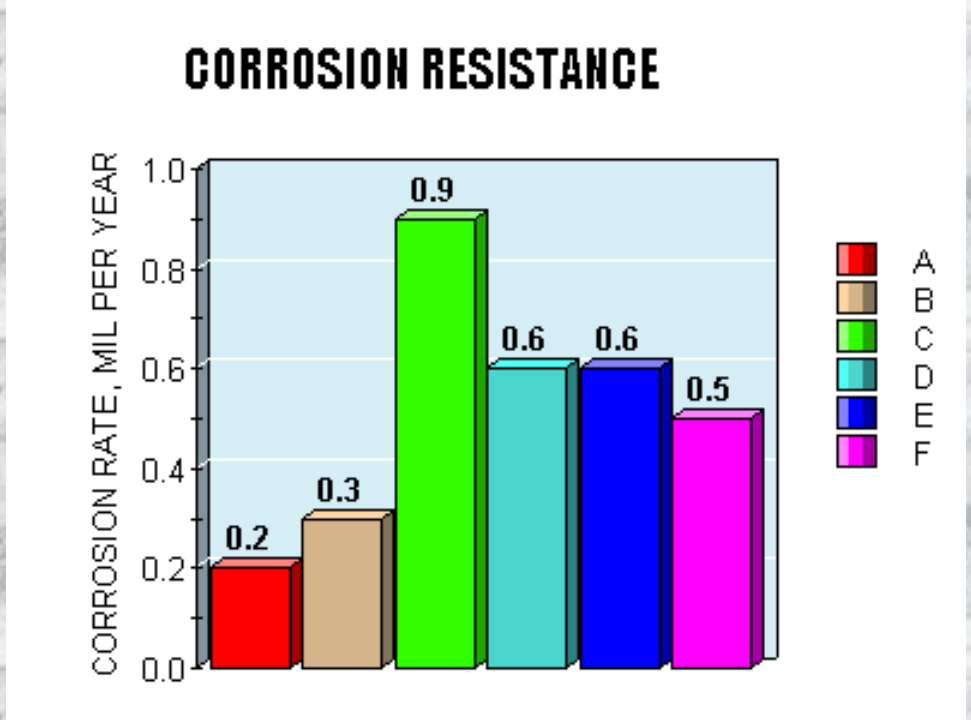
ALLOY PASSIVITY

(Continued)

Often, the contaminants in the deposit can have negative effects on Electroless Nickel's corrosion resistance. Most coatings are applied from baths stabilized with lead, cadmium or sulfur. Co-deposition of these elements with an Electroless Nickel coating will cause a severe reduction in its passivity and corrosion resistance. This is illustrated by this chart, which shows the results of corrosion tests with 6 different commercial Electroless Nickel deposits in CO_2 saturated, 3-½ percent salt brine at 200 degrees Fahrenheit.

The graph shows huge differences between the coatings. The LeKem deposit (A) had a loss of 0.2 mpy (5 um/y) while that of the other deposits was 50 to 450 percent higher. Similar tests in 10 percent HCl at ambient temperature showed even larger differences; LeKem and Deposit (B) had corrosion rates of 0.6 and 0.8 mpy (15 and 20 um/y) respectively, while Deposits C through F were 8 to 26 mpy (200 to 600 um/y).

The primary differences between these deposits were not their phosphorous content, but rather their baths' stabilizing system. LeKem is deposited from an organically stabilized bath, and contains only trace amounts of contaminants. Deposits B, C, D, E, and F, however, were found to contain 500 to 1500 ppm of either lead, cadmium, bismuth or sulfur



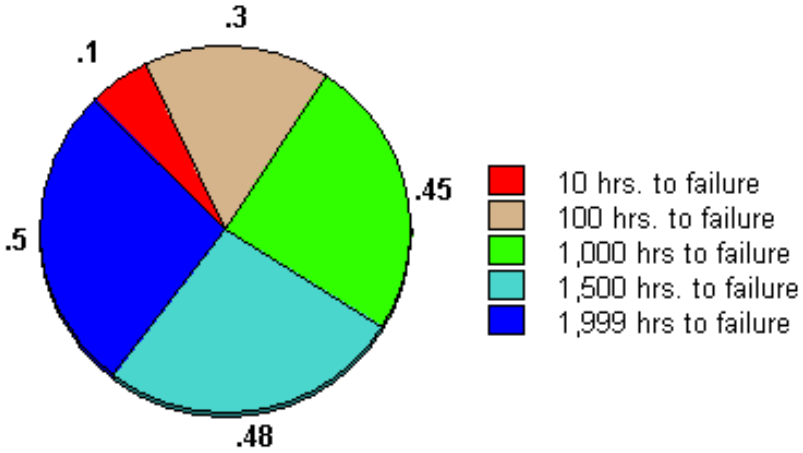
Deposit Quality

The second factor controlling an Electroless Nickel corrosion resistance is the deposit's quality.

LeKem Electroless Nickel is free of defects. The coating is homogenous and amorphous.

Unfortunately, the structure of most other coatings is not like this; instead they consist of many small islands of Electroless Nickel separated by cracks or pores. Since Electroless Nickel is a barrier coating and protects the underlying metal by sealing it off from the environment, these coatings offer only limited protection. Each crack and pore serves as a tunnel to allow the corrodent through.

AMOUNT OF COATING THICKNESS.



LeKem Electroless Nickel will provide 1000 hours of salt spray resistance, with others a thickness greater than one mil may be needed to provide the same level of protection.

Defects form in most Electroless Nickel coatings for two reasons. First the level of internal stress of low phosphorous coatings is quite high. Electroless Nickel coatings, containing only 7 to 9 percent phosphorous, develop internal stress. These coatings are like rubber bands tightly stretched across the surface of the part; they want to crack and open up in order to make themselves more stable.

Second, the brightening agents and heavy metal stabilizers in most Electroless Nickel baths co-deposit with the coatings producing defect in the deposit. These are zones where the metal is locally stretched and weak. Because of the stress in the coating, the weak zone tears and pores are formed.

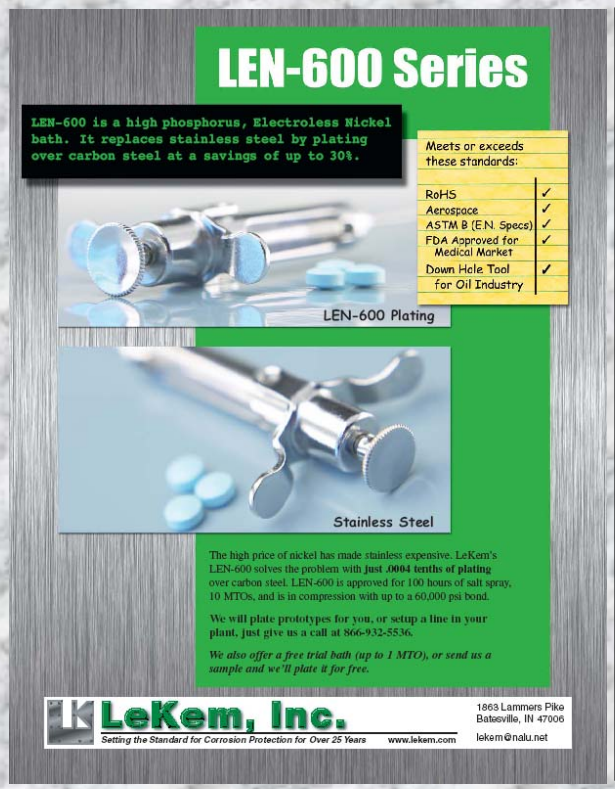
Conclusion

To provide maximum corrosion protection, both phosphorous and contaminant content must be carefully controlled.

This can only be obtained by using LeKem's high phosphorous Electroless Nickel solutions.

LeKem Press


Does Your High-Phosphorus Electroless Nickel Bath HAVE A HANGOVER???
Here are Some Symptoms
Low Rate (less than .0004)
4-5 Metal Turns
In Tension
Pitting or Staining
Salt Spray Test Failures
Heavy Metal Contamination
Under Loading Problems
Roughness at High Thickness
LeKem of Indiana has the Cure
LEN-600 Series from LeKem of Indiana
.0005-.0006 For Life of Bath
8-12 Metal Turns
In Compression
No Pitting or Staining
Color for Stainless Steel
500 Hr. Salt Spray at .0005 Thick
No Heavy Metals (less than 1 ppm)
Organically Stabilized
Easily Waste Treatable
No Roughness at High Thickness
Where Innovations & Quality Meet
LeKem, Inc.
Specializing in Electroless Nickel Solutions for Over 30 Years
1863 Lammers Pike
Batesville, IN 47006
Contact us at: 812-932-5536 • TF 866-932-5536 • FAX: 812-933-0485
E-mail: lekem@nalu.net or visit our website:
www.lekem.com


LEN-600 Series
LEN-600 is a high phosphorus, Electroless Nickel bath. It replaces stainless steel by plating over carbon steel at a savings of up to 30%.
Meets or exceeds these standards:
RoHS ✓
Aerospace ✓
ASTM B (E.N. Specs) ✓
FDA Approved for Medical Market ✓
Down Hole Tool for Oil Industry ✓
LEN-600 Plating
Stainless Steel
The high price of nickel has made stainless expensive. LeKem's LEN-600 solves the problem with just .0004 tenths of plating over carbon steel. LEN-600 is approved for 100 hours of salt spray, 10 MTOs, and is in compression with up to a 60,000 psi bond.
We will plate prototypes for you, or setup a line in your plant, just give us a call at 866-932-5536.
We also offer a free trial bath (up to 1 MTO), or send us a sample and we'll plate it for free.
LeKem, Inc.
Setting the Standard for Corrosion Protection for Over 25 Years
www.lekem.com
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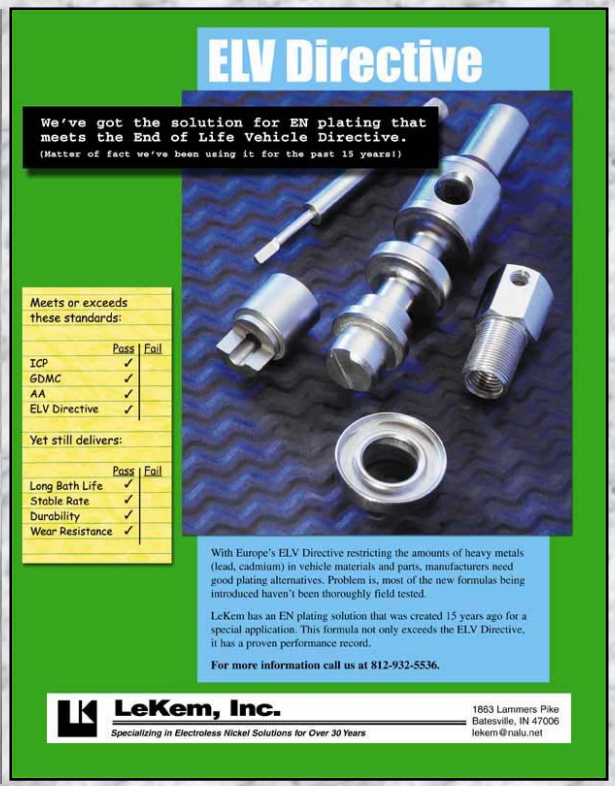

ELV Directive
We've got the solution for EN plating that meets the End of Life Vehicle Directive.
(Matter of fact we've been using it for the past 15 years!)
Meets or exceeds these standards:
Pass | Fail
ICP ✓
GDMC ✓
AA ✓
ELV Directive ✓
Yet still delivers:
Pass | Fail
Long Bath Life ✓
Stable Rate ✓
Durability ✓
Wear Resistance ✓
With Europe's ELV Directive restricting the amounts of heavy metals (lead, cadmium) in vehicle materials and parts, manufacturers need good plating alternatives. Problem is, most of the new formulas being introduced haven't been thoroughly field tested.
LeKem has an EN plating solution that was created 15 years ago for a special application. This formula not only exceeds the ELV Directive, it has a proven performance record.
For more information call us at 812-932-5536.
LeKem, Inc.
Specializing in Electroless Nickel Solutions for Over 30 Years
1863 Lammers Pike
Batesville, IN 47006
lekem@nalu.net

LEN-600 System

LEN-600 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-600 coatings are noted for the following properties: Coating is uniform, and has color for stainless steel or a semi- bright application

Advantages

- Stable, uniform rate of .0004 - .0006.
- 8-10 metal turnovers.
- No staining (yellow, brown or black).
- Excellent wear resistance, freedom from porosity on thickness of .001.
- Constant quality throughout the life of the bath.
- Tank stability.
- Deposit in compression.
- Natural lubricity, providing excellent release properties.
- Self-polishing effect in molding operations.
- Easily waste treatable.

Deposit Properties

- Phosphorous Content 10-13%
- Hardness 48-52 Rc as plated
- 68 Rc 750º F 1.5 Hours
- Internal Stress Compressive
- Ductility Pass (ASTM B-571)
- Electrical Resistively 70-100 micro ohm-cm
- Melting Point 880° C
- Density 7.75 g/cc

Adhesion Certification

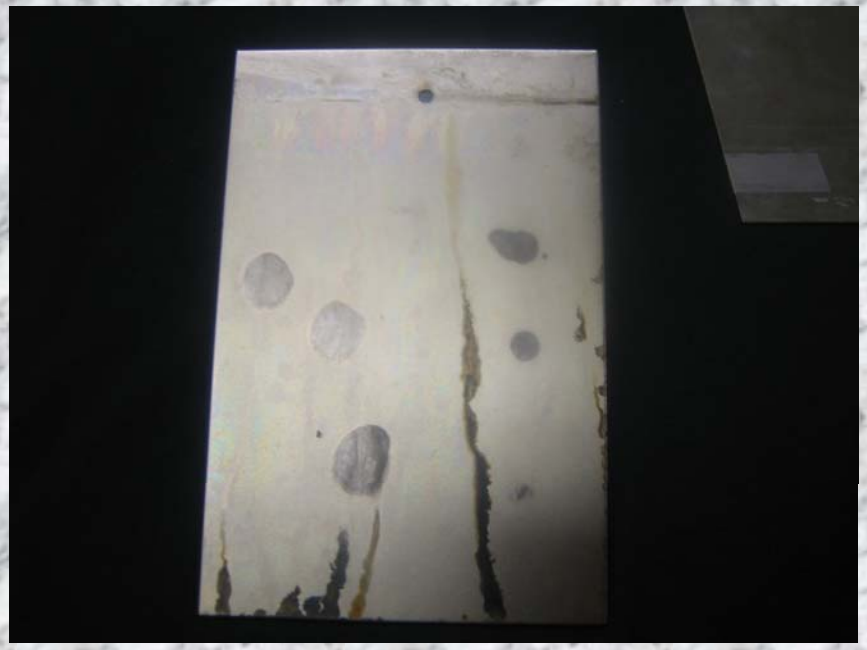
Ring Plated 1.2 mils/side

Ring Crushed -- PASS

Adhesion Failure

ASTM B-117
Salt Spray 100 hours

LeKem Passed over 500 hours



Competition Failed under 100 hours

20 Years Proven Record in Production

600 gallon Electroless Nickel line built by LeKem.
Runs up to 10,000 parts a day.