



Company Overview

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Company Profile

Electro-Spec, Inc. is continually recognized as one of the leading specialty plating facilities in the United States. With a customer base from North America to Asia and Europe, Electro-Spec is synonymous with high quality and high reliability Gold, Silver, Nickel, Copper and Tri-M3™(Tri-Alloy) electroplating. With the dedication of our new facility and equipment, our commitment to excellence in quality and service will be unsurpassed.

We take our commitment to our customers, vendors, employees and environment seriously. We believe that either in doing business with us or working for us, that commitment is ever-present. Electro-Spec is truly a leader in the plating industry, but it is our commitment that will allow us to grow and prosper for many years to come.

OUR APPROACH

People

Electro-Spec is an “employee owned” company that focuses on teamwork in every phase of the operation. Whether they are a new hire or an employee with 25 years of service, every employee plays an integral part in the development and growth of the company. As a group, we inspire each other and as a team, we aspire to succeed.

Continual Improvement

Continual improvement is accomplished by encouraging standardization of work and processes as well as ensuring a basic understanding for the importance of a well-organized workplace by training to the following standards:

- TS 16949 - Automotive
- ISO 13485 - Medical
- ISO 14001 – Environmental
- AS 9100 – Aerospace
- ISO 9001
- 6 “s”
- Six Sigma
- Root Cause Analysis

Our philosophy and commitment toward continual improvement will be enhanced as we focus on Six Sigma (Green and Yellow Belt) training for all employees.

Support

Electro-Spec’s continued success is a direct reflection of the many partnerships that we have developed with our suppliers and our customers. Electro-Spec is committed to developing strategic alliances and partnerships in all levels of business to promote communication, development and service. We believe that these partnerships will promote growth and opportunities for technological advantages in the global marketplace.

Geographic Footprint

North America to Asia and Europe

Industries Served

Aerospace

Electro-Spec has been a supplier to many of the world's leading aerospace companies for years. Involved in several new and cutting edge technologies, we have been privileged to plate parts that have gone into the Mars Rover, Star Wars Defense systems, spy satellites, Space Shuttles and many other space applications.



We are a preferred plating vendor for "Hi-Reliability" applications that require 100% conformity and zero rejects.

We are an approved supplier for; Lockheed Martin, Raytheon, Boeing, Northrop Grumman among others.

Medical

Electro-Spec is a supplier on many different types of medical components. From micro-electronic medical components, to implantable components to bio-hazard/germicidal components, Electro-Spec is a partner in both new technologies and new product development.



We have the ability to meet many of the most stringent specifications in the medical industry, with indefinite traceability for all processes that we do.

Automotive

Electro-Spec has been a leading plating supplier to many of the world's top Tier I and Tier II automotive companies. We have been involved in several new developments that have had significant benefits with regard to technology and cost reductions over previous applications. We have successfully converted many different methods and processes that have impacted Ford, GM and Chrysler on safety critical components.



Employing a variety of Six Sigma, Kaizan, Black Belt and SPC into these conversions, we stand prepared to tackle even the most difficult PPAP's and APQP's with a sound and methodical approach to meeting and exceeding your requirements.

RF/Microwave

Electro-Spec has been involved with the RF/Microwave industry for over 40 years. Starting as a plating supplier to "Specialty Connector Company" many years ago, Electro-Spec has had the privilege of being a supplier to many of the world's leading telecommunication companies. Understanding the need for precision plating, exact tolerances, consistent/uniform plating coverage and non-magnetic finishes is something that is built into all of our plating processes.



These processes are predicated on reducing RF loss, improving "skin effect", and minimizing intermodulation interference to facilitate and improve signal transmission.

Current Customers

Many of the leading and most recognizable companies in the Aerospace, Automotive, Telecommunication, Medical and Battery industries utilize Electro-Spec as a partner in their supply chain.

Services/ Products Available

Electroplating

- Variable Speed Barrel Plating
- Variable Speed Rack Plating
- Vibratory Plating
- Tri-M3™ (Tri-Alloy) Plating
- SAM's Technology
- Passivating
- Heat Treating/Annealing
- Controlled Depth (Selective Plating)
- Spouted Bed Electrode (SBE Plating)
- Rotary Line Plating (High Speed Rack Plating)

Key Plating Equipment List

- PLC Controlled Automated Plating Lines
- Spouted Bed Electrode (Manual and PLC Automated)
- Controlled Depth Selective Plating Lines
- Atmospheric Ovens
- ICP (Inductively Coupled Plasma)
- Fluorescence X-Rays
- Various Metallurgical (Cross Section, Hardness Tester, Failure Analysis)
- Steam Age
- Atomic Absorption
- High Speed "Rotary" Rack Plating Line
- Closed Loop Waste Treatment System
- Vacuum Vapor Degreasing with Ultrasonics

Product Samples

1. Aerospace customer with critical requirements

A company in the aerospace industry was nearing the finish line on a critical assembly project when an unexpected quality issue threatened to put their timeline in jeopardy. A small but geometrically complex contact with deep inside diameters required tight tolerance plating. Several trial barrel and vibratory plating runs at their usual vendor revealed uneven thickness, poor ID coverage, and nesting issues that were causing parts to nest together.

At Electro-Spec, we are a recognized innovator in the plating industry, which is why this company approached us seeking a solution to this issue that was threatening the integrity and timeline of the project. After reviewing the print, we recommended using our SBE (Spouted Bed Electrode) process, ideal for small parts with difficult geometry. Solution is continually replenished in the chamber and constantly surrounds the parts with fresh plating electrolyte, which ensured tightly controlled and uniform coverage on the OD and ID. Ultrasonic movement of the components through the fluid also served to keep them separate and prevented them from nesting together during the plating process.

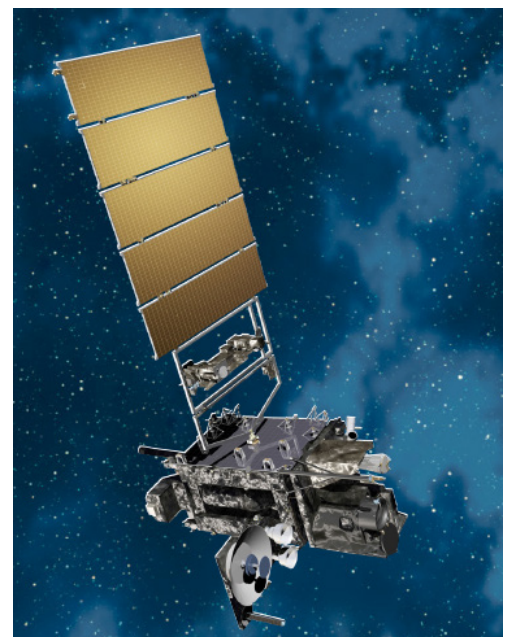


By using this process, we were able to successfully plate the contacts and satisfy the customer expectations regarding coverage and uniformity, especially in the deep IDs. They quickly contracted with us to implement this process across several different part numbers with the same quality and acceptance criteria.

If you are interested in more details about this project or the processes we used to complete it, contact us today.

2. **NASA needs help with launching a weather satellite**

One of NASA's high profile projects is the impending launch of the technology-forward GOES-R satellite, an engineering breakthrough that will provide significantly more accurate and reliable weather forecasts and severe weather outlooks. During pre-launch testing, a malfunction occurred because of a gold plating failure on a small component plated at a competing vendor. Recognizing us as an established leader in the plating industry, a representative from NASA's Goddard Space Flight Center contacted Electro-Spec for a better understanding of the issue and to explore solutions to eliminate the problem.



After many technical discussions, we concluded that “gold embrittlement” compromised the integrity of a solder joint and the best alternative to prevent this from recurring was to selectively gold plate the part. Using our highly engineered, controlled-depth plating system and specialized tooling, we demonstrated that we could selectively apply gold plate in the exact location with precise depth and consistency to overcome the embrittlement issues.

We went on to successfully plate these mission critical components, which allowed NASA to move forward with their plans to launch this next-generation weather satellite, which will provide substantially improved weather imaging and superior detection of weather phenomena.

If you are interested in learning more about Electro-Spec and how our expertise can support you’re demanding and critical plating requirements, contact us today.

3. Automotive Plating

At Electro-Spec, we listen very intently to what our customers have to say. This gives us a comprehensive insight on their needs and priorities and lays the groundwork for innovating successful long-term solutions to their immediate challenges.



A customer in the automotive industry was having consistency issues with the electroless nickel plating of a geometrically complex component. The vendor was rack plating the parts due to a critical feature they felt would be damaged by a barrel plating process. Since rack plating did not permit solution exchange in and out of the I.D. bore, the coverage was inconsistent and unacceptable.

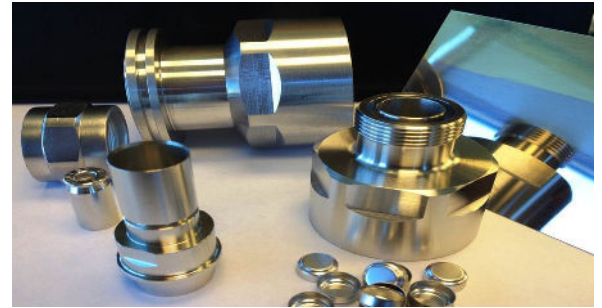
We examined the part, and developed a process using variable speed barrels on automated flight-bars. This solution would avoid damaging the part while promoting solution exchange for consistent plating on both the O.D. and I.D. Closely supervised PLC automation of the flight bars gave us unparalleled process control for repeatable, traceable operation in this safety critical and high reliability application. Far less labor intensive than rack plating, we were able to save the customer significant expense while achieving a much higher quality component.

Rigorous testing, both in the field and in simulation studies, ultimately led the “Big Three” automakers to approve this innovative plating strategy.

To learn more about this project or how our foresighted and resourceful plating solutions can benefit your organization, contact us today.

4. Telecommunication Plating

A customer in the telecommunications industry approached us at Electro-Spec to investigate a plating alternative to silver and nickel finishes that would provide improved wear and performance properties while lessening the impact that rising metal prices were having on their plating costs.



Their silver plated, high frequency components were exhibiting premature tarnishing and degradation when subjected to harsh environments, so we offered our Tri-M3 as an alternative finish. Its excellent corrosion resistance and low porosity, combined with ease of solderability and exceptional leveling capability and throwing power made it an ideal choice for plating RF connectors. We were able to reduce the plating thickness from 200 μ -in. of silver to 80 μ -in. of Tri-M3 while providing greatly improved resistance to corrosion and wear.

An additional benefit of using Tri-M3 was its low intermodulation, or tendency to generate unwanted frequencies during signal transmission. With a low surface friction (approximately 70% of silver), high conductivity, and non-magnetic properties, it significantly improved the RF signal and electrical performance of their components. In addition, with the volatility and rising commodity prices of silver and nickel, Tri-M3 enabled the customer to save substantial plating expense. The price of silver alone has more than quadrupled in the last 15 years, and the reduced thickness requirements of Tri-M3 made it one-third the cost of what they had been paying for silver plating.

With this tri-metal alloy finish, the customer achieved a winning trifecta of improved wear, improved operational performance, and reduction of plating expense. Contact us today to learn more about the advantages of Tri-M3.

Machine Capacities

Electroplating

1 to 1,000,000 pieces / Prototype to Large Volume Production

Passivating- 1 to 1,000,000 pieces / Prototype to Large Volume Production

Heat Treating/Annealing- 1 to 1,000,000 pieces / Prototype to Large Volume Production

Quality Practices

We presently are ISO 9001:2008, AS 9100:2009 and ISO 14001 certified.

We have a variety of capabilities with regard to testing equipment for both our Inspection Departments as well as our Chemical Laboratory. We have X-Ray Fluorescence, ICP (Inductively Coupled Plasma), AA Spectroscopy (Atomic Absorption), cross-section, hardness testing, and a variety of both metallurgical and analytical capabilities for failure analysis, alloy analysis and metallographic studies.



Our quality system mandates that we do various degrees of incoming inspection on all parts that we receive. Some customers are designated as “Critical”, and those customers will get a more extensive incoming inspection. This will include visual (microscope), pre-plate dimension checks, cleanliness checks, part count verification (calibrated scales), and magnetism (Gauss) for steel parts. Electro-Spec will work with customers to ensure their expectations for inspection (incoming and final) are met.

Performance Metrics

Electro-Spec utilizes a “Balanced Scorecard” to monitor and measure our internal metrics for customers, processes, equipment and training

Cost Collaboration

Electro-Spec has worked closely with numerous customers on cost reductions. These suggestions have employed selective plating on Gold “loose” piece parts for significant cost savings. Electro-Spec has also qualified its SAM’s process for Gold thickness reduction and cost savings. Tri-M3 alloy plating has replaced many applications where Silver plating was originally required. Tri-M3 has significant performance benefits over Silver, while being a fraction of the cost.

Electro-Spec works with its customers regarding specific pricing plans tailored to that customer’s needs, which allows the focus to be on business and not pricing discrepancies.

Client Benefits

ONLINE TRACKING AND EXPEDITING SYSTEM

Electro-Spec, Inc.'s innovative methods for service include the ability to follow each of your orders online. Not only can you track your orders...you can expedite, change shipping methods, view historical turnaround by part number, download packing lists, download certifications of compliance and much more. Through our "Customer Portal", you can access all of your orders as they are received, processed and shipped back to you. From the time we receive the order until the time you receive the order back, you can track your order through this system.

	Part #	PO #	Rec Date	Due Date	Status
Detail	101-3254-01	4446294-3	29-Mar-2013	03-Apr-2013	SHIPPED
Detail	YCN0102-001H	4449738-1	22-Mar-2013	01-Apr-2013	SHIPPED
Detail	YCN012-001NS	4448632-1	02-Apr-2013	09-Apr-2013	CLEANING
Detail	YCN012-001NS	4448632-1	11-Mar-2013	02-Apr-2013	SHIPPED
Detail	YCN015-001NS	4449447-1	12-Mar-2013	27-Mar-2013	SHIPPING
Detail	YFE004-002NS	4449446-1	12-Mar-2013	15-Mar-2013	SHIPPED
Detail	YFE004-006A3	4449781-1	25-Mar-2013	01-Apr-2013	SHIPPED
Detail	YFE006-018NS	4449505-1	15-Mar-2013	30-Apr-2013	KANBAN
Detail	YFE006-018NS	4449477-1	12-Mar-2013	20-Mar-2013	SHIPPED
Detail	YFE006-027A3	4449743-1	22-Mar-2013	01-Apr-2013	SHIPPED
Detail	YFE0076-001A	4447060-1	09-Nov-2012	02-Apr-2013	SHIPPED
Detail	YFE0076-001A	4447060-1	02-Apr-2013	09-Apr-2013	CLEANING
Detail	YFE0076-018A	4449867-1	01-Apr-2013	05-Apr-2013	SHIPPED
Detail	YFE0102-002A	4447347-1	14-Dec-2012	21-Mar-2013	SHIPPED
Detail	YFE0102-002A	4447347-1	17-Dec-2012	30-Apr-2013	KANBAN
Detail	YFE012-001A	4449853-1	02-Apr-2013	05-Apr-2013	PLATING
Detail	YFE015-001A	4449094-1	05-Mar-2013	01-Apr-2013	SHIPPED
Detail	YFE015-001A	4449094-1	27-Mar-2013	02-Apr-2013	SHIPPED
Detail	YFE015-001A	4449094-1	02-Apr-2013	09-Apr-2013	CLEANING
Detail	YFE015-005A	4449878-1	01-Apr-2013	04-Apr-2013	SHIPPED
Detail	YFE020-003NS	4449559-1	12-Mar-2013	15-Mar-2013	SHIPPED

If an item has shipped, you can click on the "detail link" and it will provide a hyperlink to UPS or FedEx to complete your tracking information.

If you need additional copies of documentation, you can download a PDF of the document right to your screen for each order.

This system also has the ability to manage inventory (kanban system) for orders you ship to us. You can view finished inventory, raw inventory, in process inventory and conduct releases for plating and shipment, right from your desk. You can even upload shipping documents and purchase orders to our system through this portal, when doing releases. This system is updated every 30 seconds on our website and gives you the most up to date information on all of your orders. We understand the urgency of your orders and the need for immediate feedback on the status of these orders. Whether you are in the office or at home or on the road you will always have complete access and visibility to your orders through our online tracking and expediting system!

FULLY AUTOMATED PLATING LINES

A key to Electro-Spec's success has been its automated processing lines. Most automated lines are designed primarily for high volume and have limited flexibility to handle diverse parts. But Electro-Spec integrates TQR software into the plating process to deliver dramatically increased versatility and functionality. This technology easily accommodates a variety of parts, substrates, finishes, thickness and handling methods that present problems for a traditional plater.



Operators can monitor all phases of the plating sequence and make adjustments to times, temperatures, thickness and more based on feedback they receive on a computer monitor. An independent software module called Gravo 8.0 interfaces with the production system and is the first automation software for plating lines that allows real-time ability to view and control production operations while, at the same time, collects, analyzes and reports on plant floor activity. Production lines can process 60,000-80,000 jobs per year with 8 transporters and 180 processing positions. Barrels and racks continually rotate in-solution and out-of-solution to promote more efficient plating and rinsing.

Rectifiers are specially designed to supply a consistent current to barrels, racks and parts. Controls prevent peaks that can cause irregularities in the parts.

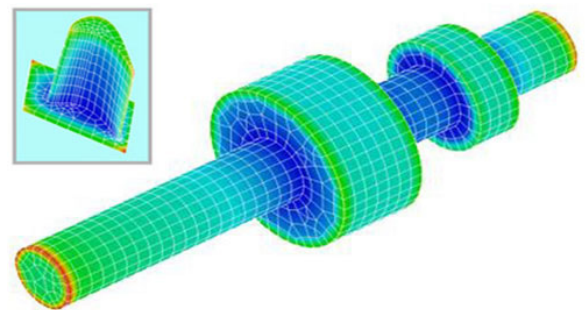
V-Saddles on the tanks act as high-current, self-cleaning contact frames to help ensure uniform current distribution.

Rinsing stations using cascading and counter-flow technology are continuously filtered and replenished with de-mineralized or de-ionized water from the waste treatment system.

NEXT GENERATION TECHNOLOGY & SOFTWARE

Gravo 8.0 is an independent software module that interfaces with 'production system' through PLC (Programmable Logic Control). The 'production system' is directly controlled by the PLC, and indirectly by WinGravo 8.0. Therefore the 'production system' operates independently of WinGravo8.0 and depends only on the PLC to function.

Gravo 8.0 is the first HMI (Human Machine Interface) automation software for 'Plating Line' that allows Electro-Spec in real-time to view, control and manage production operations while at the same time providing the capability to collect, analyze and report on all jobs processed...back to 2003.



VACUUM VAPOR DEGREASING AND VACUUM ULTRASONIC CLEANING (UTILIZING THE FOLLOWING TECHNIQUES)

· Solvent Emission Reduction

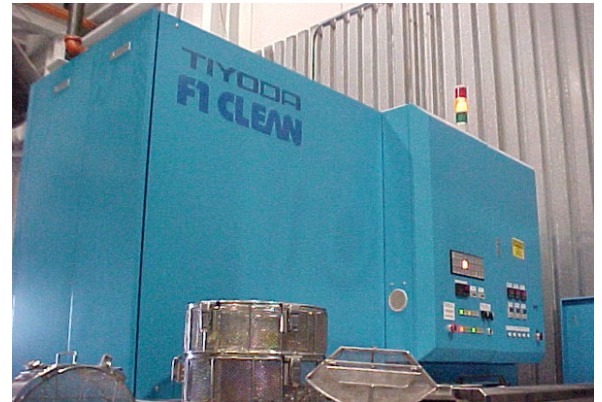
Initially the air in the cleaning chamber is evacuated so that the solvent and the air are not interfaced with each other to eliminate the solvent emissions.

· De-gassing the Solvent

When the solvent is placed under vacuum, the air dissolved in the solvent is eliminated to enhance the ultrasonic power - this means cleaner parts.

· Drying the Parts Completely

In the vacuum drying process, the vacuum is created in the cleaning chamber. The higher the vacuum, the lower the solvent boiling point becomes. The heat capacity of the parts helps boil the solvent and the evaporated vapor is recaptured and recycled in the system. In case of methylene chloride, the boiling point at atmospheric pressure is about 40°C, whereas, at 80 torr it boils at - 10°C.



CLOSED-LOOP WASTE TREATMENT SYSTEM

This closed-loop system treats and recycles the water before re-introducing it to the plating lines as rinse water.

Goema technology can separate out 6 different types of metals in the waste stream. Rinses integrated into the plating line are constantly filtered and replenished through the waste treatment system.

Remarkably, cleaning and distillation recovers over 99.9 percent of all materials. Even the material removed from the water is dried, pressed and re-purposed. Silver and gold recovery from rinses ensures recovery of all precious metals.



METALLURGICAL & CHEMICAL CAPABILITIES

Understanding its role in the supply chain, Electro-Spec's commitment to quality can be seen throughout the facility in its Inspection Departments, Metallurgical Laboratory, Chemical Laboratory and its software systems.

Critical process control is achieved through custom software that provides plating and inspection criteria to all personnel throughout the facility. Control plans, Process Flow Diagrams, Failure Mode and Effects Analysis and other industry recognized documentation is maintained through these systems and provides traceability on a part-by-part basis for all customers. Statistical Process Control is integrated into Electro-Spec's software for the Chemical Laboratory and Inspection Departments.

Utilizing only the most advanced equipment like Fluorescence X-Ray Spectrometers, Inductively Coupled Plasma Optical Emission Spectrometry, Atomic Absorption Spectroscopy and various types of other analytical equipment provides Electro-Spec with unparalleled capabilities in process control, failure analysis and product conformance.

Electro-Spec's Inspection Department can perform virtually any required test to meet most customer and industry specifications like adhesion, thickness, solderability, steam age, quench, nitric vapor porosity, ammonium sulfide and post plate tolerance allowances. Electro-Spec also can measure hardness and provide micro-sectioning to confirm thicknesses of deposits.

These capabilities help Electro-Spec to be certified by Lockheed Martin Space and Raytheon as an approved plating supplier as well as being certified to ISO 9001:2008, AS 9100:2009 and ISO 14001:2004.

Management Contacts

Jeff Smith – *President*

Mary Gordon – *Plant Manager*

Darren Habig – *Dir. Of Business Development*

David Torok – *Dir. Of Engineering*

Sandy Scifres – *Dir. Of Quality*

Nicole Stickford – *Controller*