Tuesday, April 20, 1999

9 a.m.—Welcome

9:15 a.m.—Keynote Address
Captain Gary S. O’Neill, Executive Officer, Jacksonville Naval Aviation Depot, Jacksonville NAS, Jacksonville, FL

9:45 a.m.—The Chromium Replacement Program at Boeing—Long Beach Division
Mary Ann Forrest-Woodward, Boeing—Long Beach Division, Long Beach, CA

This paper will present the status of the chromium plating replacement program at Boeing. The coatings evaluated were detonation gun (D-gun), super detonation gun (Super D-Gun) and high velocity oxyfuel (HVOF). Preliminary and final results will be reported in the following areas: Corrosion, hydrogen embrittlement, wear, fatigue, bend testing, bond strength, metallography and fatigue.

10:15-10:30 a.m.—Coffee Break

10:30 a.m.—Can a Plating Shop Operate without Vapor Degreasers—Even for Wax Coatings?
Carol Eden, United Airlines, San Francisco, CA

As we all know, aqueous cleaning is here to stay. But what can be done to remove the wax coatings that have been used for masking during the plating and stripping operations? The United Airlines Plating Shop has been perplexed with this dilemma for years. Necessity is often the mother of invention. When one has a vapor degreaser that breaks down at six-month intervals and the back-up degreaser can’t handle the load, alternatives had to be discovered. This paper will reveal alternative methods used for complete wax removal, their practicability, and the hazards and concerns of one specific replacement that is currently being used at United.

11 a.m.—Complete Chrome-free Pretreatment Process for Aluminum
Andrew J. Day, Brent International, Plc., Ridgeway, Iver, Bucks, UK

A chrome-free product has been developed for cleaning, etching, desmutting and conversion coating processes for aerospace applications. The process includes high-performance alkaline cleaners and non-chrome etch and desmutting solutions for use prior to anodizing or chemical conversion coating. Slane-based, metal-ion-free conversion coatings will also be discussed. These materials have given equivalent or superior performance to industry standard chrome-based pre-paint chemical treatments.

11:30 a.m.-1 p.m.—Lunch on your own

1 p.m.—Chromium Alternatives Update
M. Klingenberg, B. Marty & D. Schario, Concurrent Technologies Corp., Largo, FL

Concurrent Technologies Corp. (CTC) has been involved with the evaluation and implementation of chromium alternatives technologies over the last five years. During that time, four annual conferences were conducted (Advanced Techniques for Replacing Chromium: An Information Exchange), where vendors, users and potential users discussed their technologies and/or needs relative to chromium replacement. A paper was written that summarized the alternatives that were presented at these conferences, as well as those investigated by CTC. This paper provides an update on chromium replacement or enhancement technologies, focusing on technologies that have been implemented successfully in industry and the DOD, and highlighting the current areas of research in chromium replacement.

1:30 p.m.—Passivation—Getting the Properties You Want & Need
Dan Englebert, Imagineering Enterprises, Inc., South Bend, IN

Many machine shops, purchasing agents and engineers are unfamiliar with the relationship between corrosion-resistant (stainless) steel and chemical passivation. Advanced materials engineers in aerospace, electronics, medical and similar high-tech industries have utilized chemical passivation for many years. Their applications demand the maximum performance from components manufactured from corrosion-resistant steel, and they realize that chemical passivation is one of the most effective methods of achieving the desired results. This paper explains what passivation is and how it is performed, along with the testing to validate its effectiveness. It also explains the different variables to be considered and controlled during the passivation process, as well as the importance of using the cor-
correct equipment during processing. A few key items to avoid during the manufacturing and/or thermal processing are presented.

2:215 p.m.—Coffee break

2:15 p.m.—Overview Briefing: The “New” Joint Group on Pollution Prevention—Integrating & Solving Common Acquisition & Sustainment Needs

Robert Hill, NASA, Kennedy Space Center, FL

The military services, Defense Logistics Agency (DLA) and NASA have co-sponsored the establishment of the Joint Group on Pollution Prevention (JG-PP). The JG-PP provides engineering, technical and business services required to identify and accomplish validated pollution prevention projects. Projects will be facilitated through partnerships among industry contractors; affected Army, Navy, Marine Corps and Air Force weapon system program managers and depot process owners; NASA center and enterprise managers; and the Defense Contract Management Command. These partnerships will identify and validate alternatives to HAZMAT’s usage. Once engineering authorities have validated an alternative, the industry contractor will utilize the Single Process Initiative (SPI) block change to modify contracts for implementation across all affected systems and components. Depot sustainment maintenance activities will utilize the respective service/agency change mechanism for implementation. JG-PP project findings will be made available to government and industry for future use on pollution prevention opportunities.

2:45 p.m.—TBA

3:15 p.m.—Panel Discussion on HVOF

4:30 p.m.—Exhibit Open (Cocktail Reception)

Wednesday, April 21

8 a.m.—Introduction to IVD Aluminum on Aerospace & Commercial Parts Per MIL-C-83488
Howard Little, AAA Plating & Inspection, Inc., Compton, CA

This presentation will be highly illustrated, showing aircraft parts, connectors, fasteners and magnets finished in ion vapor deposited (IVD) aluminum. Specific illustrations will show: Degreasing of parts; aluminum oxide blasting of parts; IVD coating of parts, both in rack coaters, pin rack and barrel coaters; glass beading after IVD; chromate conversion coating; and option of primer after IVD.

8:30 a.m.—Qualification of HVOF Thermal Spray Coatings as Replacement for Hard Chrome Plating on Aircraft Landing Gear
Bruce D. Sartwell, Naval Research Laboratory, Washington, DC

A project is underway to qualify WC/Co and WC/Co-Cr coatings deposited using the high-velocity oxygen-fuel (HVOF) thermal spray technique as replacements for hard chrome plating that is currently being used in both manufacturing and repair of aircraft landing gear. Numerous Defense Department organizations and private companies are participating in this project. A Joint Test Protocol has been prepared that includes fatigue, corrosion, wear, impact, hydrogen embrittlement, and chemical compatibility testing of the HVOF coatings as compared to hard chrome. Results will be presented for a substantial amount of these tests, as well as the results of rig testing of actual landing gear components from Defense Department aircraft. The development of standards and specifications for the HVOF coatings (which is being executed in conjunction with the SAE Aerospace Metals Engineering Committee) will also be discussed.

9 a.m.—Zero-waste Cadmium Plating for the Aerospace Industry

Mandar Satchankar, IonEdge Corporation, Pt. Collins, CA

In spite of environmental concerns related to cadmium electroplating, it is extensively used in the aerospace and airline sectors for coating high-strength steels, and the trend is likely to continue. As an alternative, a novel zero-waste cadmium dry plating method has been developed and commercialized. This physical vapor deposition (PVD) method does not use liquids. At the same time, it recycles cadmium in situ to eliminate waste. The quality of the coatings is equal to that of the plated cadmium. Hydrogen embrittlement has been eliminated.

9:30-9:45 a.m.—Coffee break in the Exhibit Hall

9:45 a.m.—A New Process for On-site Repair of IVD Aluminum Coatings

Christopher J. Nuse, Southwest Aeroservice, Inc., Tulsa, OK

This paper will cover what has taken place and what changes have been made over the past four years of operation. It will also cover types of equipment and size requirements, as well as chemical formulations of 

Aqueous cleaning has replaced solvent-based cleaning operations prior to overhaul cleaning plasma spray and plating operations at United Airlines. In 1995, an innovative spray-wash technique was established that has provided outstanding service. This paper will cover what has taken place and what changes have been made over the past four years of operation. It will also cover types of equipment and size requirements, as well as chemical formulations that meet the desired cleanliness for pre-cleaning, plasma spray and plating operations.

10:15 a.m.—Comparison of Wear Rates Between Chrome Plating & Various HVOF Tungsten Carbide Coatings Applied Against Bearing Materials & Coatings

H.F. Taber, J.R. Shadley, E.F. Pybiaski & I. Negt, Department of Mechanical Engineering, The University of Tulsa, Tulsa, OK; & W.A. Emery & J.D. Nune, Southwest Aeroservice, Inc., Tulsa, OK

Tungsten carbide (WC) thermal spray coatings have had increasing acceptance in commercial aircraft applications. Most of these applications have been driven by the desire to replace chromium electroplate because of environmental and economic considerations. A significant factor that affects the suitability of chromium electroplate and WC thermal spray coatings on aircraft parts is the wear rate of the coating and its mating surface. This paper presents results of wear tests based on the ASTM G77 Block on ring procedures, comparing chrome plating to various WC thermal spray coatings applied against various types of bearing materials and coatings. Residual stresses in the coatings are examined as a wear resistance factor.

10:45 a.m.—Practical Aspects of Aqueous Cleaning at United Airlines: A Four-year Perspective

Douglas B. Wyatt, United Airlines Maintenance Operations, San Francisco International Airport, San Francisco, CA

Aqueous cleaning has replaced solvent-based cleaning operations prior to overhaul cleaning plasma spray and plating operations at United Airlines. In 1995, an innovative spray-wash technique was established that has provided outstanding service. This paper will cover what has taken place and what changes have been made over the past four years of operation. It will also cover types of equipment and size requirements, as well as chemical formulations that meet the desired cleanliness for pre-cleaning, plasma spray and plating operations.
11:15 a.m.—2 p.m.—Lunch in the Exhibit Hall; “Window of Opportunity”

2 p.m.—An Industrial Process with Practically No Free Hydrogen or Oxygen (For Hard-coating & Architectural Anodizing of Aluminum)

W. Corcoran, R. Huebsch & R. Reinhardt, Duralectra Inc.; L. Lerner, Sanford Process Corp.; & Dr. M. Lerner, Tomin Corp., Wellesley, MA

Straight DC anodizing processes occasionally generate detonating gas, causing explosions over the surface of an electrolyte during a run, thereby creating a hazardous environment. For safety, it is required in Korea and other countries to cover cathodes with entrapping-free-hydrogen bags, still allowing ions to flow through. The 20-year-long industrial experience of the low-voltage-hard coating (fed by the resonant DC+AC power sources) demonstrated that the free-oxygen-and-hydrogen generation is reduced to levels that eliminate occurrence of hazardous explosions, even in the extreme case when the electrolyte surface is covered with a thick foam blanket. This phenomenon is another industrial justification (along with the 6Vdc-drop of the tank voltage, better colors, etc.) of the arc-free-hypothesis for a low-voltage DC+AC anodizing and hard-coating.

2:30 p.m.—The Impact of RCRA & HSWA on the Aerospace Industry

Edward J. Acosta, New Mexico Environment Department, Santa Fe, NM

The Resource Conservation and Recovery Act (RCRA) was passed in 1976 and established the statutory requirements that are the basis for hazardous waste regulations. The Hazardous and Solid Waste Amendments (HSWA) of 1984 made changes in RCRA that are primarily concerned with the land disposal program. RCRA and HSWA impact metal finishing in the aerospace industry with numerous regulations that affect day-to-day operations. An overview of RCRA and HSWA will be provided with respect to generation, transportation, storage, treatment and disposal of hazardous wastes in metal finishing operations.

3 p.m.—Modular Racking for Automated Electroplating Lines: A Five-year Retrospective

Bradley C. Johnson, Boeing Commercial Airplane Group, Portland, OR

Boeing Portland’s A4580’s Processing Group made the move to modular racking in its automated plating facility five years ago during its design phase. This paper is a five-year retrospective on the pros and cons of modular racking and the lessons learned during this project. The paper covers the criteria used for the decision to change to modular racking, as well as the long-term effect of implementation of this program. Other issues covered are: Dealing with racking as a “tool,” and the use of non-design tools in the aerospace industry.

3:30-3:45 p.m.—Coffee break

3:45 p.m.—Aircraft Depainting

Raymond Williams, U.S. Technology Corp., Canton, OH

There have been many advances in recent years in aircraft depainting. The most extensively used advances have been in soft abrasive blasting, such as plastic media. In excess of 15,000 military aircraft have been successfully depainted using this process. Now commercial aircraft are beginning to utilize this process with abrasives designed specifically for aerospace requirements. This paper looks at the testing and implementation of Mil Spec type 7 starch-based media and how it impacts service
life, flow days composites, thin skins, alclad, aladine, safety and the environment.

4:15 p.m.—Environmental Technology Verification Program Update
Alva Edwards Daniels, U.S. Environmental Protection Agency & Jim Voytko, CEF, Concurrent Technologies, Largo, FL
The U.S. EPA and Concurrent Technologies are cooperating in a program for the metal finishing industry called the "Environmental Verification for Metal finishing" (ETV-MF) program. This program, in association with EPA’s Common Sense Initiative Metal Finishing Sector, is a pilot for verifying innovative, commercial-ready technologies designed to improve industry performance and achieve cost-effective pollution prevention. This paper will describe how the program operates, how program activities are guided by a group of industry stakeholders, and how the program can benefit pollution prevention technology providers and users involved with aerospace and airlines finishing. Current program activities and future plans will be discussed.

4:45 p.m.—Panel discussion on U.S. EPA ETV-MF Project & its application to the aerospace industry

Thursday, April 22

8 a.m.— Conductivity Improvement of Anodic Coatings by Ag Process
Shi Hua Zhang & Lin Zhang METALAST International, Inc., Minden, NV
Using a patented Ag process, Ag was deposited in the pores of formed anodic coatings to restore the conductivity of anodic film, which otherwise is an excellent insulator. Although the insulating properties of anodic coatings have found broad applications in industry, anodic coatings with a restored conductivity are also attracting interest because of their unique property of fairly good corrosion resistance and conductivity. This paper will focus on the theoretical considerations as to the maximum conductivity that can be approached by the Ag process, taking into consideration two factors—the thickness and the porosity of anodic coatings. The mechanism of the Ag process by AC current will also be presented. Following the theoretical discussion, experimental work will be discussed, including the optimization of process parameters, such as the thickness of anodic coating, Ag processing time, and Ag process voltage. The results of relationship between the surface resistance of silvered anodic coatings and the thickness of anodic coatings will also be provided.

8:30 a.m.— Multiple-step Alternatives to Chromate Passivation
Craig V. Bishop & Dr. Gary Loar, McGean-Rohco, Cleveland, OH
One of the many advantages that hexavalent-chrome-based passivation methods enjoy is that they can be applied in a single step following cleaning or plating. Attempts to eliminate hexavalent chromium have been hampered by the self-imposed constraint of matching this single-step advantage. In this paper, we will explore how a multiple-step paradigm can be used to meet all the of the advantages of hexavalent chromium based on passivation.

9 a.m.— The Latest Developments in Hard Chrome Replacement Using Coatings Applied by HVOF
J.D. Nuse, David A. Somerville & James M. Emery, Southwest Aeroservice, Inc., Tulsa, OK
For the last several years, lab testing and service evaluations have been conducted to evaluate the feasibility of replacing electrolytic hard chrome with tungsten-carbide-based powders applied with high velocity oxy-fuel (HVOF) thermal spray equipment. Largely driven by environmental concerns related to the application and waste disposal from the chrome plating process, increasing evidence suggests that the thermal spray coatings may provide additional advantages in terms of application requirements, service performance and product...
life cycle costs. This paper will present some of the latest developments in hard chrome replacement utilizing tungsten carbide cobalt and tungsten carbide cobalt chrome applied by HVOF. This includes test methodologies used by various organizations, as well as in-service testing undertaken by commercial airlines and the military. Issues related to application techniques, surface finishing and coating removal methods will also be discussed.

9:30 a.m.—Aircraft Engine Parts Cleaning
Carlos H. Peres, PROCECO Ltd., Montreal, Quebec, Canada
This paper will review the introduction of new cleaning equipment at the engine overhaul shop of a major U.S. airline. Low reliability of the old equipment, higher anticipated production levels, and the need to provide maintenance traceability prompted the complete replacement of the old equipment. Two new immersion tank lines, plus one turntable and one belt conveyor washer were installed in 1998. After stripping down the engine, parts or components are first pre-cleaned in a turntable-type power spray washer. Depending on the part (cold or hot-end related), it is then processed in one of the two tank lines. A PCB-based system controls and records process parameters of both lines and ties them to the batch in process. A belt-type conveyor washer is used for cleaning parts that are subject to repairs. The new equipment provides a significant improvement to the cleaning operation, meeting production levels, and providing increased up-time and maintenance traceability.

10:30 a.m.—Panel Discussion—Finishing Technologies A to Z
11:15 a.m.—Garland Award & Business Meeting
Lunch on your own following business meeting
1 p.m.—Bus boards for tour at Jacksonville Naval Aviation Depot
1:15 p.m.—Bus departs

Fly into Jacksonville International Airport

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Get to the Forum for less by calling Conventions in America (CIA) at 1-800/929-4242 and ask for Group #511. You will receive 5-10% off the lowest applicable fares on Delta Air Lines, or the lowest available fare on any other carrier. Take an additional 5% off Delta if you purchase at least 60 days prior to departure. Travel between April 17–25, 1999. All customers of CIA also receive free flight insurance of $100,000. Avis Car Rental is offering special corporate rates.

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Hotel Accommodations At the Jacksonville Hilton & Towers
While the Forum and Exposition will be held at the Osborn Convention Center, a block of guest rooms is being held fororum registrants at the Jacksonville Hilton and Towers, the city’s newest waterfront, full-service hotel. In 1998, the Hilton was awarded AAA’s Four Diamond Award in recognition of service excellence, hospitality and exceptional guest accommodations.

The hotel is conveniently located—only 20 minutes from Jacksonville International Airport and beautiful Florida beaches. A Ruth’s Chris Steak House and two additional restaurants are located within the hotel.

The Jacksonville Hilton and Towers is located on the riverwalk overlooking the St. Johns River and is convenient to many north Florida attractions and activities. The Jacksonville Landing, a riverfront marketplace offering shopping and dining, is only a short boat trip from the dock of the hotel. While on the Riverwalk, guests may explore the Jacksonville Museum of Science and History or visit the River City Brewing Company, a micro-brewery and restaurant. Historic San Marco is nearby, with outdoor cafes and unique shops. The beaches and day cruises are only a few minutes from the hotel. Championship golf and deep sea fishing excursions are also readily available.

Attendees will use the Jacksonville Peoplemover, which operates from 6:30 a.m.–8 p.m., to get to the Convention Center; 35¢ one way.

Please make your reservations before the March 18 deadline.
• Be sure to tell hotel staff that you will be attending the 1999 Aerospace/Alpine Plating Forum, in order to get the $119 room rate.
• Contact the Jacksonville Hilton Hotel directly: Phone 904/398-8800; FAX 904/398-5570
• The hotel is located at 1201 Riverplace Blvd., Jacksonville, FL 32207.
A Training Course For Jobshops & Aerospace/Airline Rework Facilities

One of AESF’s most popular courses will be held April 20–21 in conjunction with the Forum. Perhaps other members from your facility would be interested in taking this course, which is intended for training personnel who work in “hard chrome” plating shops. It has specific benefit for line workers and shop foremen, but can also be of great use to shop owners and managers of hard chromium plating facilities, too.

A special opportunity in the timing of this course is that the students will be able to attend the opening reception of the Exhibit on Tuesday afternoon and enjoy lunch in the Exhibit Hall on Wednesday. This way, they can see new products and equipment, too—especially those that are specifically used by the aerospace/airline industry.

Course attendees may also register for the tour to the Naval Aviation Depot. Note: Don’t delay. Tour registration is limited to 100, and you must register by March 18 to be able to take the tour.

Course is Particularly Useful to Jobshops, Aerospace & Airline Plating Facilities

A background in chemistry and metallurgy is provided so that the student can better understand the problems involved in plating chromium onto a variety of substrates. Detailed information is provided on analytical control of plating solutions, preparation, masking and polishing operations, and more. Clean Air Act compliance information is also covered, along with equipment design, including scrubbers and mesh pad systems.

Additional Subjects Include:
Surface preparation, grinding, polishing, shotpeening & repair of damaged areas; hydrogen embrittlement; cleaning/reverse etching; principles of chromium plating; post-plate finishing; purifying plating solutions; reversible rack plating; wastewater treatment; analysis of plating solutions; equipment & equipment maintenance; design of scrubbing/ventilation systems.

Instructor for JAX Course

Frank Altmayer, CEF, AESF’s technical director, is president of Scientific Control Laboratories, Inc., Chicago, IL. His company specializes in analytical testing, designing plating plants and consulting on plating problems, wastewater treatment and disposal of hazardous waste. Frank holds a BS in chemical engineering and an MS in metallurgy from the Illinois Institute of Technology. He has served as an AESF instructor for more than 20 years.

Free Details: Circle 114 on reader service card.
Optional Tour
Thursday, April 22, 1 p.m.

Naval Aviation Depot Jacksonville, FL
Tour limited to 100 people.

With a workforce of more than 4,100 civilian employees, the NADEP is the largest tenant command aboard NAS Jacksonville and the largest industrial employer in Northeast Florida and Southeast Georgia. NADEP personnel perform maintenance on the F-14 Tomcat carrier-based fighter, the EA-6B prowler carrier-based electronics countermeasures aircraft, P-3 Orion/EP-3 Aries II anti-submarine patrol aircraft, the F/A-18 Hornet strike fighter, and the T-2 Buckeye basic jet trainer, and emergency rework and modification on S-3 Viking carrier-based electronic countermeasures aircraft, emergency rework and modification of the S-3 Viking carrier-based patrol aircraft, and have retained capability of the A-7 Corsair II light attack jet aircraft for foreign military sales customers. In addition to providing engineering support, Depot teams are sent all over the world to assist ships, squadrons and other units that require modification, maintenance or repair work.

With the most modern, state-of-the-art engine facility in the Navy, NADEP JAX has complete rework capability for all repairable components, assemblies and accessories. In FY 1997, the Depot processed 28 J52s, 84 F404s, 218 F404 modules, 58 TF34s and 11 TF41s. The engine program comprises four percent of the Depot's workload.

Premier Engine Depot Repair Facility in the World for J52s, F404s & TF34s
NADEP Jacksonville is the premier J52, F404 and TF34 engine depot repair facility in the world. The Power Plant Complex is currently performing all DoD J52, TF34 and F404 engine repairs, including all engine components and accessories. The state-of-the-art Kemen Engine Cell is capable of testing engines through the entire operating envelope, in both automated and manual modes.

The Cleaning and Plating Facility (86,156 ft²) houses all cleaning, plating, plasma spray and other operations required for depot repair.

Tour Includes:
- Aircraft Strip Hangar
- Tactical Aircraft Line
- Machine Shop
- Patrol Aircraft Line
- Materials Engineering Center
- Crinkle Engine Facility
- Cleaning & Plating Facility
- Kemen Engine Test Cell

Note: Because of security and liability considerations, tour attendance is limited to 100 people. You must be registered by March 18 to take the tour. Exhibit-only registrants are not eligible for the tour.

Tour attendees MUST take the AESF-provided transportation to NADEP. Because NADEP is located on a military base, parking is restricted. Tickets for this plant tour are $25. Tickets will not be available on site. If you don't want to miss this tour of an outstanding facility, your registration and payment must be received by March 18.

ASTM Course on Hydrogen Embrittlement: Process Control & Failure Analysis of Plated or Coated Parts
April 18 at the Osborn Convention Center

Dr. Louis Raymond of LRA Labs and Dr. J. Barton Boodey of the RSL™ Technology Center will present a comprehensive short course on methods of controlling a plating or coating process to prevent hydrogen embrittlement of plated or coated parts. These methods include the most advanced accelerated testing techniques that can also be used for failure analysis, including fasteners for aerospace and aircraft applications using the Rising Step Load Method™.

Course Outline
Four sessions:
1. Hydrogen embrittlement standard test methods and their relationship to service performance
2. Review of the new standard, ASTM F1940, for the verification of process control of hydrogen embrittlement during various plating and coating processes highlighting guidelines on use
3. The differences between internal hydrogen embrittlement (IHE) from processing and environmentally induced hydrogen embrittlement (EHE)
4. Methods of sorting IHE from EHE in failures.

For more information or to register, contact:
LRA Labs, P.O. Box 7925, Newport Beach, CA 92658
phone 949/474-7727; FAX 949/474-9807; e-mail LouRaymond@aol.com.

Course fee: $275

Fundamentals of Thermal Spray Process (Technology), Course #259081499
Tuesday, April 20, 8 a.m.–5 p.m.

Thermal spray coatings continue to receive attention as a method of solving corrosion, wear and compatibility problems. Thermal spray processes of electric arc combustion and plasma spray coatings can apply almost any material to the surface of another. These coating systems must be engineered and applied correctly to operate as an overlay surface. This seminar provides an overview of thermal spray processing science, as well as applications and practice.

Seminar outline: Surface science; equipment & theory; processing & design; materials production for thermal spray processes; selected applications; testing & characterization.

Instructor: Dr. Robert C. Tucker, Jr., FASM. Dr. Tucker is a retired corporation fellow and director, PRAXAIR Surface Technologies, Inc.

Course fee: $275
To receive a registration form, please call ASM International: 1-800/336-5152 Ex. 5900 (Customer Service)
Phone 440/338-5151
FAX 440/338-4634
E-mail: Cust-Srv@po.asm-intl.org
Web: http://www.asm-intl.org
Our “first-class” exhibitors at the 1999 Expo:

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SERFILCO Ltd.

TAF Incorporated

METALAST International, Inc.

DYNAPOWER CORPORATION

Activity Center—American Electroplaters and Surface Finishers Society (AESF) #401
12644 Research Parkway
Orlando, FL 32826-3298
Exhibit: The AESF is the sponsor of the Aerospace/ Airline Plating & Metal Finishing Forum. Visit the AESF’s Activity Center and learn all about the AESF’s member services, other major conferences (SUR/FIN® ’99—Cincinnati, June 21–24 and AESF Week 2000, which includes the AESF/EPA Conference for Environmental Excellence), courses (including customized, in-house), publications, and monthly journal—Plating and Surface Finishing. Managers of jobshops and captive shops are encouraged to list their shop’s finishing capabilities in the 1999 Shop Guide (FREE listing).

FREE Details: Circle 501 on reader service card.

Automate-Tech Inc. #408
4711 126th Ave. N., Suite J
Clearwater, FL 33762
Exhibit: Automate-Tech Inc. is a manufacturer of turn-key metal finishing equipment for companies starting new ventures and plant expansions. Products include plating lines, programmable hoists and controls, custom filtration systems, corrosion-resistant ventilation and air pollution control, and waste treatment systems, including zero discharge atmospheric evaporators. Our engineered systems will meet the client’s specifications, insuring the project’s success. Automate-Tech’s staff has years of experience and designs metal finishing systems for clients throughout the world. Visit our booth and discuss your requirements with us.

FREE Details: Circle 502 on reader service card.

BFGoodrich/Corzan Industrial Systems #202
9911 Brecksville Rd.
Cleveland, OH 44141
Exhibit: BFGoodrich/Corzan Industrial Systems will feature Corzan CPVC pipe and sheet for use in finishing industry installations.

FREE Details: Circle 503 on reader service card.

Brent America #306
16961 Knott Ave.
La Mirada, CA 90638-6015
Exhibit: Brent America will feature its chemicals for aircraft maintenance and engine overhaul, as well as testing materials.

FREE Details: Circle 504 on reader service card.

NEW PRODUCTS EXHIBITED!
Brooktronics Engineering Corp. #509
28231 Ave. Crocker #70
Valencia, CA 91355
Exhibit: Brooktronics Engineering will have on display examples of brush plating applications for the aerospace industry. This includes BEC 455 Zinc-Tin, which was originally designed as a replacement coating for cadmium. This solution is now under study for use as an on-site repair process for damaged or worn IVD aluminum corrosion protective coatings.

FREE Details: Circle 505 on reader service card.

Brushtronics Engineering #212
405 Main St.
Laurel, MD 20707-4115
Exhibit: Brush plating equipment and chemicals will be featured in the Brushtronics Engineering booth.

FREE Details: Circle 506 on reader service card.

NEW PRODUCTS EXHIBITED!
CASTion/L&T Technology #212
290 Moody St.
Ludlow, MA 01056-1244
Exhibit: CASTion/L&T Technology offers turnkey zero-discharge wastewater/chemistry recovery systems based on ultrafiltration, reverse osmosis, ion exchange and proprietary CAST™ (Controlled Atmosphere Separation Technology) flash distillation systems.

FREE Details: Circle 507 on reader service card.

NEW PRODUCTS EXHIBITED!
CHEMCO Mfg. Co., Inc. #407
3175 MacArthur Blvd.
Northbrook, IL 60062
Exhibit: CHEMCO will be introducing its newly developed MACH III and MACH III Paint Overspray Collection Systems, specifically designed to bring the aerospace industry into compliance with the EPA’s new testing method 319. These “state-of-the-art” systems have gone through exhaustive independent testing to insure strict compliance with the new regulation. In addition, low VOC--striped paint booth wall coatings and high-strength flame retardant floor coverings, both in current use by the USAF, will be on display.

FREE Details: Circle 508 on reader service card.

NEW PRODUCTS EXHIBITED!
Cyanide Destruct Systems Inc. #405
383 Elmira Rd.
Guelph, Ontario, Canada
Exhibit: Cyanide Destruct Systems and CDSS Environmental Services have two exciting announcements. We have moved! Our new advanced, zero discharge treatment facility accepts bulk solid and liquid loads in addition to drums and precious metals. We are also introducing a new pretreatment system for generators of...
Detrex Corp. ......................... #410
401 Emnett Ave.
Bowling Green, KY 42101
Exhibit: Detrex Corp. is a major supplier of standard and custom cleaning systems—both aqueous and solvent. Detrex provides equipment, chemistry, waste disposal services and nationwide field service support. For more than 80 years, Detrex has solved cleaning problems. FREE Details: Circle 513 on reader service card.

NEW PRODUCTS EXHIBITED!

Duall Division, Met-Pro Corporation .......... #404
1550 Industrial Dr.
Owosso, MI 48867
Exhibit: Duall will be featuring its new Olimaster oil mist eliminator and its new HydroLance wet dust collector. Duall 3500, which will be Duall’s Beta NO. 2000 NO, scrubbing system, Hexmaster Chrome Dry Scrubber, corrosion-resistant PVC hoods, ducts, fans, scrubbers and installation services.
FREE Details: Circle 514 on reader service card.

NEW PRODUCTS EXHIBITED!

DYNAPOWER CORPORATION .. #309
P.O. Box 9210
S. Burlington, VT 05407
Exhibit: DYNAPOWER will exhibit rectifiers and computer control systems designed for metal finishing applications. Included will be the highly efficient Watt-Saver compact rectifier and switchmode power supply line. From 10 kW to 10 MW; the versatility and capabilities of DYNAPOWER’s total in-house design and manufacturing services provide both standard and custom configuration options. A complete selection of literature describing the full range of DYNAPOWER products and services will be available.
FREE Details: Circle 515 on reader service card.

Enviro Tech International Inc. ....... #203
2525 W. LeMoyne
Melrose Park, IL 60160
Exhibit: Enviro Tech International Inc. will feature chemicals, cleaners and solvents.
FREE Details: Circle 516 on reader service card.

Fibergrate Composite Structures Inc. .......... #307
4115 Keller Springs Rd., Suite 224
Addison, TX 75001
Exhibit: Rigides® II and II fiberglass multistrand gratings from Fibergrate Composite Structures Inc. are the first gratings to combine the high performance of fiberglass molded and pultruded grating construction with the low cost of metal grating. Rigides is corrosion resistant and silicone-free, making it a great floating or shelving product for the aerospace/airline plating industry. Molded Chemcrete® and Fibercrete® resins are also available, as well as our new Fiberglaze® stair-tread covers.
FREE Details: Circle 517 on reader service card.

NEW PRODUCTS EXHIBITED!

Finishers’ Management ...................... #110
4350 D'Iberville Center, Suite B
Glenview, IL 60025
Exhibit: New copies of and subscriptions to Finishers’ Management, the management publication of the surface finishing industry, will be free to all show attendees.
FREE Details: Circle 518 on reader service card.

Finishers Tech Corp. ....................... #507
319 Main St.
P.O. Box 247
E. Berlin, CT 06023
Exhibit: Finishers Tech will be displaying the latest in automated abrasive blast cleaning and shotpeening equipment. We will also have on hand information about our thermal spray processing equipment, such as abrasive belt grinders for material stripping, thermal spray coating systems and super finishers for final finishing of coatings. On hand will be information on our one-piece flow unit that blast-clean turbine blades, and units that automatically blast-clean aircraft stator assemblies.
FREE Details: Circle 519 on reader service card.

Flo King Filter Systems .................... #505
1320 Bennett Dr.
Longwood, FL 32750-6341
Exhibit: Flo King in-tank systems pump, filter, agitate and treat without leaks or spills. Ideal for prototype and production plating, anodizing, chromating, iron phosphating, and many other manufacturing applications. A new 12,000-gph system is ideal for large tanks or anywhere aggressive agitation is desired. Systems also available in flow rates of 400, 1200, 3000 and 5000 gph.
FREE Details: Circle 520 on reader service card.

Joint Group on Pollution Prevention ....................... #104
100 CTC Drive
Johnstown, PA 15904
Exhibit: The Joint Group on Pollution Prevention (JG-PP) provides engineering, technical and business services required to identify and accomplish validated pollution prevention projects. JG-PP project findings will be made available to government and industry for future use on pollution prevention opportunities. Current projects include non-chromate conversion coatings, low VOC paint alternatives and cadmium alternatives.
FREE Details: Circle 521 on reader service card.

JPS Technologies ...................... #102
11110 Deerfield Rd.
Cincinnati, OH 45242
Exhibit: JPS Technologies, Inc. will be showing its manufacturing capabilities. A new 12,000-gph system is complete manual and automatic lines. Automated overhead and sideline systems for retrofit will also be showcased. Supplies for all your plating needs are available at JPS Technologies, Inc.
THIS EXHIBITOR IS A AESF RESEARCH SPONSOR.
FREE Details: Circle 522 on reader service card.

KCH Services ....................... #501
P.O. Box 126
Forest City, NC 28043
Exhibit: KCH Services will feature ventilation and scrubber equipment from Air Management Division and automatic equipment, including the covered tank concept, from Engineered Systems Division. This new division manufactures finishing tank line systems, including programmable hoists and controls.
THIS EXHIBITOR IS A AESF RESEARCH SPONSOR.
FREE Details: Circle 523 on reader service card.

Kinetico Engineered Systems Division ............. #109
10975 Kinsman Rd.
Newbury, OH 44065
Exhibit: Kinetico Engineered Systems Division will feature the continuous ion exchange (CIX) integrated water recycling system for the aerospace facility’s water recycling system. CIX systems feature a patented high-efficiency countercurrent ion exchange process, using up to 50 percent less chemicals than conventional treatment. Compared to conventional wastewater treatment, the CIX recycles approximately 60–70 percent of an aerospace facility’s water, with more than 75 percent reduction in operating costs.
FREE Details: Circle 524 on reader service card.

McGean-Rohco, Inc. ..................... #411
9520 E. Cee-Bee Dr.
Downtown, CA 90024
Exhibit: The Cee-Bee Division of McGean-Rohco manufactures maintenance and overhaul chemicals for the commercial and military aircraft industry. Featured products include non-toxic, non-chlorinated, environmentally friendly paint strippers, Super Bee interior/exterior cleaners, and Honey Bee deodorants and cleaners for toilet systems.
THIS EXHIBITOR IS AN AESF RESEARCH SPONSOR.
FREE Details: Circle 525 on reader service card.

NEW PRODUCTS EXHIBITED!

Mefag Division, Met-Pro Corporation .......... #406
P.O. Box 144
160 Cassell Road
Harleysville, PA 19438
Exhibit: Mefag’s display will feature the V-Series Oil Absorbing Filter that is specifically designed for the removal of oil and grease from cleaning solutions, rinse water, wastewater and other corrosive liquids. The V-Series incorporates a newly designed basket for maximum absorptive capacity and is constructed from all polypropylene materials for superior corrosion resistance. V-Series filters are available with a full selection of polypropylene pumps and optional slurry tank. Information on Mefag’s high flow horizontal disk filtration systems, all polypropylene systems, in-tank systems, standard out-of-tank systems and filter media will also be available.
FREE Details: Circle 526 on reader service card.

NEW PRODUCTS EXHIBITED!

METALAST International, Inc. ....... #511
2241 Park Place
Minden, NV 89423
Exhibit: The METALAST anodizing technology includes a superior chemistry, proven research and computerized process controls. In addition, we provide continuing support to our licensees through education, training, industry marketing, referrals and technical assistance. Through our professional staff and programs at the METALAST Tech Center, we offer consistency to the anodizing industry and to the anodizing process itself. METALAST provides manufactures uniform and replicable results, superior finish characteristics and a network of professional licensees.
METALAST: Tomorrow’s Anodizing Today.
FREE Details: Circle 527 on reader service card.

Metal Finishing Magazine/Elsevier Science Inc. .............. #210
660 White Plains Rd.
Tarrytown, NY 10591-5153
Exhibit: Stop by our booth and pick up sample copies of our monthly magazine, Metal Finishing. Information will be available concerning getting a subscription to Metal Finishing and receiving our two directories: Metal Finishing Guidebook & Directory and Metal Finishing Organic Finishing Guidebook & Directory. Various books covering this marketplace will also be displayed for sale.
THIS EXHIBITOR IS AN AESF RESEARCH SPONSOR.
FREE Details: Circle 528 on reader service card.

NCA Systems, Inc. ...................... #112
2180 Calumet St.
Clearwater, FL 33765
Exhibit: NCA Systems, Inc. will feature an electrically heated electrolytic nickel module, photo library of aircraft cleaning and plating equipment installations, and custom-fabricated tanks. Polypropylene tank design with standard assembly details. NCA features custom-CAD design and start-to-finish capabilities.
FREE Details: Circle 529 on reader service card.
company’s new LENIUM™ products provide current users of vapor depressurers with economical drop-in replacements for HCFCs, HFCs and chlorinated solvents. FREE Details: Circle 532 on reader service card.

**PHOTO EMISSION TECH., INC. #308**
3255 Grande Vista Dr.
Newbury Park, CA 91320
Exhibit: PHOTO EMISSION TECH., INC. will be exhibiting surface cleanliness measuring and monitoring systems. These systems detect both organic and/or inorganic contamination, help in optimizing the cleaning process and continuously monitor the process. Come and evaluate various cleaning processes for effectiveness.
FREE Details: Circle 533 on reader service card.

**Plating and Surface Finishing (P&SF) #401**
12644 Research Parkway
Orlando, FL 32826-3298
Exhibit: Plating and Surface Finishing is the official journal of AESF, the Forum’s sponsor. Copies of the March “Aerospace/Airline Forum Show Issue” will be available. P&SF keeps its readers informed through a balance of feature and technical articles, information about the AESF and its sister organizations, plus reports of activities in various industry-related arenas—government relations, environmental concerns, safety and regulatory updates, and ongoing research. P&SF also publishes the Shop Guide, a directory of jobshops and captive finishing shops and their services, cross-referenced by processes, substrates, surface preparation, special processes and organic coatings. **THIS EXHIBITOR IS AN AESF RESEARCH SPONSOR.** FREE Details: Circle 534 on reader service card.

**Pellu Systems Inc. #310**
1041 Lees Mill Rd.
Atlanta, GA 30349
Exhibit: The Pellu Process for wastewater treatment is a highly efficient, cost-effective, integrated process that signifies a major breakthrough in the treatment of heavy-metals-contaminated wastewater. It is effective for all heavy metals, chelated or non-chelated semi-metals (such as arsenic and selenium), as well as some ranges of organics (such as phenols, EDTA and waste solutions high in BODs, CODs and CN). The process directly removes all hexavalent chromium to compliance levels with no intermediate step required for reduction to trivalent chromium. In a typical multi-component metal waste solution, conventional methods require multiple pH adjustments during the treatment process, as well as large holding tanks and clarifiers for the metal flocculation process. The Pellu Process removes all heavy metals from industrial wastewater at just one pH setting.
FREE Details: Circle 535 on reader service card.

**Petroferm Inc. #412**
5415 First Coast Highway
Fernandina Beach, FL 32034
Exhibit: Petroferm’s BIOACT® and AXAREL® products are high-performance, environmentally sound cleaning agents for the automotive, aerospace, electronics, optics and general metalworking industries. The Pellu Process for wastewater treatment is a highly efficient, cost-effective, integrated process that signifies a major breakthrough in the treatment of heavy-metals-contaminated wastewater. It is effective for all heavy metals, chelated or non-chelated semi-metals (such as arsenic and selenium), as well as some ranges of organics (such as phenols, EDTA and waste solutions high in BODs, CODs and CN). The process directly removes all hexavalent chromium to compliance levels with no intermediate step required for reduction to trivalent chromium. In a typical multi-component metal waste solution, conventional methods require multiple pH adjustments during the treatment process, as well as large holding tanks and clarifiers for the metal flocculation process. The Pellu Process removes all heavy metals from industrial wastewater at just one pH setting. When you have Ammonium in your tank, it’s time to set a SNARE.
line of comprehensive literature will be displayed. Stop by to learn why Rapid is the leader in the power supply industry.

FREE Details: Circle 537 on reader service card.

**Sandia Corporation**

**Tabletop A**

4005 Gypsy Lane

Philadelphia, PA 19144

Exhibit: Sandia Corporation will display its new operating program, SandaWin, for the SANDA FACTS™ Titrination System. SandaWin is based on the popular Labview platform and allows users to run automated titrations with just one mouse-click. The SandaWin software package has everything you need for full automation of the titration process. Accurate and multiple-task analyses of plating baths will be demonstrated.

FREE Details: Circle 538 on reader service card.

**NEW PRODUCTS EXHIBITED!**

**ScrubAir Vent Systems, Inc.**

1220 Karl Ct.

Wauconda, IL 60084

Exhibit: In addition to exhibiting working models of a ScrubAir three-stage composite mesh pad chrome separator and a ScrubAir wet bed scrubber, ScrubAir will also be displaying its chrome separator/hood combination unit. This efficient system saves space, eliminates chrome build-up and leaks into the duct system, and the rinse-down water flows back into the tank. Also new: ScrubAir customized maintenance and service contracts.

FREE Details: Circle 539 on reader service card.

**Sequoia Corp.**

4009 Renate Dr.

Las Vegas, NV 89103

Exhibit: Stop by Sequoia for your free sample of our high-quality plating tapes on display. Our tapes are designed to fit every electroplating need your company may have. We have powder coating tapes, polyester film, fiberglass-aluminum, as well as high-temperature, adhesive, non-adhesive tapes (which are great for hard chrome and electroless nickel), lead and aluminum foil. Our tapes come in different sizes, so there’s less waste and greater value for our customers.

FREE Details: Circle 540 on reader service card.

**SERFILCO, Ltd.**

1777 Shermor Road

Northbrook, IL 60062

Exhibit: SERFILCO will feature filtration equipment for electroplating, anodizing and cleaner solutions as well as for waste-treat polishing. Systems utilize cartridges, discs, bags or permanent filter media. Collection and pumping stations and SER-DUCTOR air-free agitation systems to improve process efficiency will also be presented.

FREE Details: Circle 541 on reader service card.

**NEW PRODUCTS EXHIBITED!**

**Southwest United/Southwest Aeroservice Inc.**

430 S. St. Louis Ave.

Tulsa, OK 74120

Exhibit: Southwest Aeroservice, Inc. is a FAA/JAA-approved repair station utilizing thermal spray, welding, machining, grinding and plating services to repair aircraft components. Southwest Aeroservice has developed a process to replace hard chrome plating that does not have a negative impact on health, safety or the environment. The process applies tungsten carbide cobalt (WC-Co), using the HVOF thermal spray system. Southwest United Industries, Inc., is a certified metal finishing company specializing in plating, precision grinding, NDT, anodizing and painting services for the aircraft/aerospace and medical industries.

FREE Details: Circle 542 on reader service card.

**NEW PRODUCTS EXHIBITED!**

**TAFA Incorporated**

146 Pembroke Rd.

Concord, NH 03301

Exhibit: TAFA Incorporated offers engineered aerospace surface technologies and coatings/chromium plat-
## CHEMICALS

<table>
<thead>
<tr>
<th>Process Type</th>
<th>Company Name</th>
<th>Catalog Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anodizing Processes</td>
<td>Brooktronics Engineering</td>
<td>#509</td>
</tr>
<tr>
<td></td>
<td>Brushtronics Engineering</td>
<td>G</td>
</tr>
<tr>
<td></td>
<td>METALAST International, Inc.</td>
<td>#511</td>
</tr>
</tbody>
</table>

## Brightening, Blackening & Antiquing Processes

<table>
<thead>
<tr>
<th>Company Name</th>
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</tr>
</thead>
<tbody>
<tr>
<td>McKeen-Rohco, Inc.</td>
<td>#411</td>
</tr>
<tr>
<td>Petrofum, Inc.</td>
<td>#412</td>
</tr>
<tr>
<td>Turco Products</td>
<td>#211</td>
</tr>
</tbody>
</table>

## Cleaners—Alkaline, Acidic & Emulsion

<table>
<thead>
<tr>
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<tr>
<td>Brent America</td>
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</tr>
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<tr>
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</table>

## Cleaners—Solvents

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<td>Brent American</td>
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</tr>
<tr>
<td>Detrex Corp.</td>
<td>#410</td>
</tr>
<tr>
<td>Enviro Tech International Inc.</td>
<td>#203</td>
</tr>
<tr>
<td>McKeen-Rohco, Inc.</td>
<td>#411</td>
</tr>
<tr>
<td>Turco Products</td>
<td>#211</td>
</tr>
</tbody>
</table>

## Coatings—Conversion

<table>
<thead>
<tr>
<th>Company Name</th>
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</thead>
<tbody>
<tr>
<td>Finishes Tech Corp.</td>
<td>#507</td>
</tr>
<tr>
<td>Joint Group on Pollution Prevention</td>
<td>#104</td>
</tr>
</tbody>
</table>

## Coating—Thermal Spray

<table>
<thead>
<tr>
<th>Company Name</th>
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</thead>
<tbody>
<tr>
<td>Praxair Specialty Products</td>
<td>C</td>
</tr>
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</table>

## Plating Processes

<table>
<thead>
<tr>
<th>Company Name</th>
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<tr>
<td>Brooktronics Engineering</td>
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</tr>
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</tbody>
</table>

## Strippers

<table>
<thead>
<tr>
<th>Company Name</th>
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</thead>
<tbody>
<tr>
<td>CHEMCO Mfg. Co., Inc.</td>
<td>#407</td>
</tr>
<tr>
<td>McKeen-Rohco, Inc.</td>
<td>#411</td>
</tr>
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<td>Turco Products</td>
<td>#211</td>
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</table>

## EQUIPMENT

### Plating & Processing Systems

<table>
<thead>
<tr>
<th>System Type</th>
<th>Company Name</th>
<th>Catalog Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automated Plating &amp; Processing Systems</td>
<td>Automate-Tech Inc.</td>
<td>#408</td>
</tr>
<tr>
<td></td>
<td>JPS Technologies</td>
<td>#102</td>
</tr>
<tr>
<td></td>
<td>KCH Services</td>
<td>#501</td>
</tr>
<tr>
<td></td>
<td>NCA Systems, Inc.</td>
<td>#112</td>
</tr>
<tr>
<td></td>
<td>Sanda Corporation</td>
<td>A</td>
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</tbody>
</table>

## Brush Plating Systems & Accessories

<table>
<thead>
<tr>
<th>Company Name</th>
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<tr>
<td>Brooktronics Engineering</td>
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<tr>
<td>Brushtronics Engineering</td>
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</tbody>
</table>

## Hoist Transporters (Automatic & Manual)

<table>
<thead>
<tr>
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<td>KCH Services</td>
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## Processing Lines & Tanks

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Automate-Tech Inc.</td>
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<tr>
<td>Detrex Corp.</td>
<td>#410</td>
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<tr>
<td>Sanda Corporation</td>
<td>A</td>
</tr>
</tbody>
</table>

## Software—Process Monitoring & Control

<table>
<thead>
<tr>
<th>Company Name</th>
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</thead>
<tbody>
<tr>
<td>METALAST International, Inc.</td>
<td>#511</td>
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</tbody>
</table>

## Thermal Spray Coating Equipment

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Catalog Number</th>
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</thead>
<tbody>
<tr>
<td>TAFAR Inc.</td>
<td>#304</td>
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</tbody>
</table>

## Plating & Processing Auxiliary Equipment

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Catalog Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>VeeMetco</td>
<td>#312</td>
</tr>
</tbody>
</table>

## Chillers & Refrigeration Equipment

<table>
<thead>
<tr>
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## Filters & Filtration Systems

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<tbody>
<tr>
<td>CHEMCO Mfg. Co., Inc.</td>
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<tr>
<td>Columbus Industries, Inc.</td>
<td>#311</td>
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<tr>
<td>Flo King Filter Systems</td>
<td>#505</td>
</tr>
<tr>
<td>Kinetic Engineered Systems Div.</td>
<td>#406</td>
</tr>
<tr>
<td>Meflak Div., Met-Pro Corporation</td>
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</table>

## Heaters & Heat Transfer Equipment

<table>
<thead>
<tr>
<th>Company Name</th>
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<tr>
<td>Cleveland Process Corporation</td>
<td>#402</td>
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## Heat Exchangers

<table>
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<th>Company Name</th>
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<tr>
<td>F.C. Wett Associates Ltd.</td>
<td>#403</td>
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## Meters, Monitors & Controllers

<table>
<thead>
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## Mixing & Agitation Equipment

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<thead>
<tr>
<th>Company Name</th>
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<tbody>
<tr>
<td>SERFILCO Ltd.</td>
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## Power Supplies

<table>
<thead>
<tr>
<th>Company Name</th>
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</thead>
<tbody>
<tr>
<td>DYNAPOWER CORPORATION</td>
<td>#309</td>
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<tr>
<td>Rapid Power Technologies</td>
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</tbody>
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## Pumps

<table>
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## Racks

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<thead>
<tr>
<th>Company Name</th>
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<tbody>
<tr>
<td>Fiberglass Composite Structures Inc.</td>
<td>#307</td>
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</table>

## Cleaning Equipment

<table>
<thead>
<tr>
<th>Company Name</th>
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<tbody>
<tr>
<td>Detrex Corp.</td>
<td>#410</td>
</tr>
<tr>
<td>NCA Systems, Inc.</td>
<td>#112</td>
</tr>
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</table>

## Pollution Control Equipment

<table>
<thead>
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<td>CHEMCO Mfg. Co., Inc.</td>
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<td>#404</td>
</tr>
<tr>
<td>KCH Services</td>
<td>#501</td>
</tr>
<tr>
<td>ScrubAir Vent Systems, Inc.</td>
<td>#204</td>
</tr>
</tbody>
</table>

## Water Pollution Control Equipment

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<thead>
<tr>
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</tr>
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<tbody>
<tr>
<td>Automated-Tech Inc.</td>
<td>#408</td>
</tr>
<tr>
<td>CASTion/L&amp;T Technology</td>
<td>#212</td>
</tr>
<tr>
<td>Cyanide Destruct Systems Inc.</td>
<td>#405</td>
</tr>
<tr>
<td>Daul Div., Met-Pro Corp.</td>
<td>#404</td>
</tr>
<tr>
<td>Kinetic Engineered Systems Div.</td>
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<td>USFilter</td>
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## Supplies

### Blasting Equipment & Media

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<tr>
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<tr>
<td>Finishes Tech Corp.</td>
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## Pipes, Fittings, Valves, Floors & Drains

<table>
<thead>
<tr>
<th>Company Name</th>
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</tr>
</thead>
<tbody>
<tr>
<td>BF Goodrich/Corzan Industrial Sys.</td>
<td>#202</td>
</tr>
<tr>
<td>Fibergrate Composite Structures Inc.</td>
<td>#307</td>
</tr>
</tbody>
</table>

## Tape

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<tr>
<td>PAL Sales, Inc.</td>
<td>#305</td>
</tr>
<tr>
<td>Sequoia Corp.</td>
<td>#503</td>
</tr>
</tbody>
</table>

## Waste Treatment/Water Recycling/Recovery/Environmental Services

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</tr>
<tr>
<td>Kinetic Engineered Systems Div.</td>
<td>#406</td>
</tr>
<tr>
<td>PAL Sales, Inc.</td>
<td>#305</td>
</tr>
<tr>
<td>Pellu Systems Inc.</td>
<td>#303</td>
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</table>

## F.A.A. Repair Stations

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Catalog Number</th>
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<tbody>
<tr>
<td>Southwest United/Southwest Aeroservice Inc.</td>
<td>#201</td>
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## Plating Services

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Catalog Number</th>
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<tbody>
<tr>
<td>Southwest United/Southwest Aeroservice Inc.</td>
<td>#201</td>
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## Testing/Analytical Laboratories

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<tr>
<th>Company Name</th>
<th>Catalog Number</th>
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<tr>
<td>CASTion/L&amp;T Technology</td>
<td>#212</td>
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## Trade Associations

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Catalog Number</th>
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<tbody>
<tr>
<td>American Electroplaters &amp; Surface Funders Society</td>
<td>#401</td>
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## Training

<table>
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<tr>
<th>Company Name</th>
<th>Catalog Number</th>
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<tr>
<td>American Electroplaters &amp; Surface Funders Society</td>
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## Publications

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Catalog Number</th>
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<tbody>
<tr>
<td>Plating and Surface Finishing</td>
<td>#401</td>
</tr>
<tr>
<td>Finisher's Management</td>
<td>#110</td>
</tr>
<tr>
<td>Metal Finishing Magazine/Elsevier Science Inc.</td>
<td>#210</td>
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## GOVERNMENT AGENCIES

<table>
<thead>
<tr>
<th>Agency Name</th>
<th>Catalog Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. EPA Environmental Technology Verification</td>
<td>#301</td>
</tr>
</tbody>
</table>
Registration Form: 1999 Aerospace/Airline Plating & Metal Finishing Forum & Exposition

Must be accompanied by payment. Deadline for Advance Registration: March 18, 1999

AFTER THIS DATE, REGISTER ON-SITE

1. Which best describes your job title?
   - Chief executive
   - Vice President, other corporate officer
   - Production/Plant manager
   - Engineering Director/manager
   - Mfg. process engineer
   - Electrical, electronics engineer
   - Environmental engineer, technician
   - Design engineer
   - All other engineers, technicians
   - Sales, marketing
   - Research manager/director
   - Chemical manager, technical dir./mgr.
   - All other chemists, technicians
   - Quality control/assurance
   - All other managers
   - Foremen, supervisors
   - Plating/Finishing Operators
   - Consultant
   - Retired
   - Other

2. Which best describes your place of employment? (Choose one)
   - Jobshop
   - Captive Shop
   - Other

3. Primary industry served
   - Aerospace
   - Automotive
   - Appliance
   - Aerospace
   - Electronics/PWB, including surface mount
   - Decorative finishing-automotive, furniture, jewelry
   - Environmental control
   - Industrial & engineering finishes
   - Lightning protection/grounding
   - Plating/Finishing Operators
   - Barrel tumbling/burnishing/vibratory finishing
   - Electroplating
   - Conversion coating
   - Electroforming
   - Brush plating
   - Chemical & physical vapor deposition
   - Barite/paraffin
   - Sieving/filtration
   - Vacuum coating
   - Other

4. Please check your primary field of interest (Choose only 4)
   - Electrospray
   - Electroplating
   - Plating
   - Refinishing
   - Electroforming
   - Finishing
   - Passivating
   - Phosphating
   - Barrel tumbling/burnishing/vibratory finishing
   - Electroplating
   - Machining
   - Blasting
   - Polishing
   - Coating
   - Powder Coating
   - Other

5. Method of payment
   - Enclosed is my check or money order #_____.
   - Charge to my credit card: 
     - MasterCard
     - VISA
     - American Express

6. I wish to become an AESF member and register at the member rate! NON-REFUNDABLE
   - AESF Member Dues renewal $90
   - $90

7. I wish to renew my AESF member dues! NON-REFUNDABLE
   - AESF Member Dues renewal $95
   - $95

8. I wish to register for the following:
   - Advance Registration
   - Member
   - Non-member
   - AERO 99-01 Complete Forum & Exhibit (Apr. 20–22)
     - $175
   - $200
   - AERO 99-02 Chromium Plating for Engineering Applications (Apr. 20–21)
     - $480
   - $580
   - AERO 99-03 Tour of Naval Aviation Depot (Apr. 22; advance only; no on-site sale; limited to 100)
     - $25
   - $25
   - AERO 99-04 Exhibit Only (Apr. 20–21)
     - $0

Registration Policies
If you cancel a registration more than 15 working days before the start of the educational program, you will receive a full refund. Registrations cancelled thereafter will be subject to a $50 service charge. Registrants who do not attend and do not notify AESF prior to the program will be charged the entire fee. Telephone and FAX registrations are subject to the same policy. Membership in the AESF is on an individual basis. If you, personally, are not a member, please pay the Non-Member rate. Payment of registration fee conveys right to attend only. No video taping or recording allowed. AESF shall not be liable beyond the refund of the registration fee. No on-site refunds of registration fees will be made. Contact Headquarters in writing for all adjustments. Circumstances may make it necessary to cancel a program or to substitute other qualified speakers. Please consider this when arranging transportation, as AESF cannot assume responsibility for non-refundable tickets. If the program is not held, for any reason, the liability of the AESF is limited to a refund of the registration fee.

Total:

Three Ways to Register:
1. Mail to: AESF
   12644 Research Parkway
   Orlando, FL 32826-3298

2. Call in your registration
   407/281-6441
   (by credit card)

3. FAX form to
   407/281-6446
   (by credit card)