

Plating and Surface Finishing & AESF International Headquarters

12644 Research Parkway

Orlando, FL 32826-3298

Phone: 407/281-6441 • FAX: 407/281-6446

<http://www.aesf.org>



Plating and Surface Finishing (ISSN 0360-3164)

is published monthly by the American Electroplaters and Surface Finishers Society, Inc. (AESF), with executive, editorial and advertising offices at 12644 Research Pkwy., Orlando, FL 32826-3298; telephone 407/281-6441. The AESF is an educational society for the advancement of surface finishing, including electroplating and allied processes. Copyright 1999 AESF. All rights reserved. Preferred Periodicals postage paid at Orlando, FL, and additional offices. Yearly subscription rate for AESF members is \$16, which is included with the annual dues. Subscription rate for non-

members in the USA, Canada and Mexico is \$60; foreign rate is \$60, plus an additional \$20 to cover shipping & handling; single copies (domestic) are \$8 per copy and (foreign) \$9 per copy. The November 1998 issue, with the *AESF Shop Guide*, is \$25. Back issues (six months or older) are \$12 per copy (domestic and foreign). A change of address should reach *Plating and Surface Finishing* 60 days preceding the issue with which it is to become effective. (Please include former address.) Claims for missing issues cannot be honored after six months.

Postmaster: Send Form 3579 to **AESF**, 12644 Research Pkwy., Orlando, FL 32826-3298.

AESF Officers

- **President: Robert T. Groom**, Reilly Plating Company, Inc., 17760 Clarann St., Melvindale, MI 48122; 313/928-6800
- **First Vice President: Paul L. Frank**, Henkel Surface Technologies, 1615 Johnson Rd., N.W., Atlanta, GA 30318; 404/799-1292
- **Second Vice President: Kenneth W. Lemke**, Canadian Finishing Systems, Ltd., 3455 Harvester Rd., Unit 22, Burlington, Ontario, Canada L7N 3P2; 905/634-5168
- **Past President: Kenneth J. Gatchel**, KG Enterprises, Inc., 1398 Andrew S.E., Kentwood, MI 49508; 616/455-2081
- **Treasurer: S.O. "Skip" Cassell**, Ames Metal Products, 4323 South Western Blvd., Chicago, IL 60609; 773/523-3230
- **Executive Director: Ted Witt**, CEF, AESF Headquarters
- **Assistant Executive Director: W. Joan Harrison**, AESF Headquarters

AESF Board of Directors

- **Timothy G. Baublitz**, Seiler-Hughes, 138 West Barney St., Baltimore, MD 21230; 410/727-6770
- **I. Gene Burman**, Brent America, Inc., P.O. Box 68021, Anaheim, CA 92817-8021; 714/967-0059
- **Dennis L. Foster**, Delta Faucet, 55 E. 111th St., Indianapolis, IN 46280; 317/573-3483
- **Charles A. Frank**, CEF, Precious Plate Florida, 10265 Sandy Run Rd., Jupiter, FL 33478-9336; 561/820-8150
- **Peter A. Gallerani**, CEF, Integrated Technologies, Inc., 552 Peacham Rd., Danville, VT 05828; 802/684-1016
- **Ted Kodama**, Craftsman Plating & Tinning Corp., 1250 W. Melrose St., Chicago, IL 60657; 773/477-1040
- **Dr. Henry H. Law**, TSSL Laboratories, 101 Crawford Corner Rd., Room 3K-430, Holmdel, NJ 07733-3030; 732/949-3963
- **John S. Lindstedt**, Artistic Plating Company, Inc., 405 W. Cherry St., Milwaukee, WI 53212; 414/271-8138
- **Fred Mueller**, CEF, Multi-Flex Plating Co., 500 Eastbroadway Ave., Clifton Heights, PA 19018; 610/622-0223
- **Howard L. Saunders**, Nashville Wire Products, 295 Driftwood Ave., Nashville, TN 37210; 615/252-2570
- **John C. Tenison-Woods**, Peninsula Metal Finishing Consultants Pty. Ltd., P.O. Box 6019, Karingal 3199, Victoria, Australia; 61-03-5971-2125
- **Dr. I-yuan Wei**, Apex Electrical Interconnection Consultants LLC, 1046 W. Areba Ave., Hershey, PA 17033; 717/533-8593

AESF Publications Board

- **Chairman: Howard M. Smith**, Atotech USA, Inc., 1750 Overview Dr., Rock Hill, SC 29731; 803/817-3516
- **Myron E. Browning**, CEF, Matrix Technologies, 7248 Bernadine Ave., West Hills, CA 91307; 818/999-4511
- **Robert F. Lee**, CEF, Rogers Corp., One Technology Dr., Rogers, CT 06263; 860/774-9605
- **Dr. James H. Lindsay**, General Motors Research & Development Center, 30500 Mound Rd., Mail Code 480-106-500, Warren, MI 48089-9055; 810/986-0696
- **Dr. Donald L. Snyder**, Atotech USA, Inc., 1750 Overview Dr., Rock Hill, SC 29731-2000; 803/817-3639
- **Roger J. Timmer**, Lacks Enterprises, Inc., 5460 Cascade Rd., S.E., Grand Rapids, MI 49546; 616/956-7337
- **Dr. I-yuan Wei**, Apex Electrical Interconnection Consultants LLC, 1046 W. Areba Ave., Hershey, PA 17033; 717/533-8593
- **Chairman, Paper Awards Committee: Dr. George A. DiBari**, International Nickel, Inc., Park 80 West-Plaza Two, Saddle Brook, NJ 07663; 201/368-4808

Articles in this publication may not be reproduced, in full or in part, without express permission of the Editor. Statements of fact or opinion given in articles and papers in *Plating and Surface Finishing* are those of the contributors. Neither *Plating and Surface Finishing* nor the American Electroplaters and Surface Finishers Society, Inc., assumes responsibility for them. All acknowledgments and references in articles are the responsibility of the authors. *Plating and Surface Finishing* is indexed in *Applied Sciences and Technology Index* and is abstracted in *Chemical Abstracts*, *Metal Working Review*, *Metal Abstracts*, *Engineering Index*, *Technical Data Digest*, *Bulletin Analytique* and others. *Plating and Surface Finishing* is annually microfilmed by University Microfilms, Ann Arbor, MI. Authors wishing to submit papers for consideration for publication in *Plating and Surface Finishing* may receive a guide, "Yes, You Can Write Right for P&SF," by contacting AESF Headquarters at the above address.

Index to Advertisers & QwikLynx

Receive supplier information fast using *P&SF's* Index/QwikLynx, or circle detail numbers on postpaid reader service cards.

Advertiser	Page #	Phone	FAX	E-mail/Website
AESF 1999 Shop Guide Form Label carrier		407-281-6441	407-281-6446	www.aesf.org
AESF SUR/FIN® '99.....	50	407-281-6441	407-281-6446	www.aesf.org
Atotech USA, Inc.	3 rd cover	803-817-3500	803-817-3666	
Corfin Inc.	39	603-893-9900	603-893-6800	www.corfin.net
Cyanide Destruct Systems Inc.	98	519-837-1899	519-837-1622	hrobey@uoguelph.ca
Danglers, Inc.	60	401-274-7742	401-944-1969	
DeFelsko Corporation	74	800-448-3835	315-393-8471	www.defelsko.com.
De Nora North America, Inc.	27	732-545-5100	732-545-5170	dnora@yahoo.com
Duall Div., Met-Pro Corporation	16	517-725-8184	517-725-8188	
Gardner Management—EN '99	24	800-950-8977	513-527-8950	www.pfonline.com/en
Heatbath Corporation	25	413-543-3381	413-543-2378	info@heatbath.com
Intrepid Industries, Inc.	89	908-534-5300	908-534-4338	
KCH Services, Inc.	17	828-245-9836	828-245-1437	kchsales@blueridge.net
Kocour Company	43, 68	773-847-1111	773-847-3399	www.kocournet.com
Larry King Corporation	59	718-481-8741	718-481-9859	www.gdi.net/plateworld
Lucent Technologies	7	800-362-7781	908-582-6700	www.lucent.com
Mefiag Div., Met-Pro Corp.	60	215-721-6030	215-723-6758	
Mesa West, Inc.	59, 63	714-634-2526	714-634-8560	www.mesa-west.com
Metalx, Inc.	71	704-758-4997	704-758-5033	barry@twave.net
Metalast International, Inc.	9	702-782-8324	702-782-2498	Bmackay@metalast.com
Process Technology	35	800-621-1998	440-974-9561	www.process-technology.com
Rapid Power Technologies, Inc.	2 nd cover	800-332-1111	203-775-0666	www.rapidpower.com
Reliable Corporation	3	203-574-5083	203-597-0167	
Sanda Corporation	63	800-999-2993	215-849-8102	www.netaxs.com-sanda
Savitt Industrial Products, Inc.	69	732-972-0016	732-462-3769	
Schaffner Mfg. Co., Inc.	102	412-761-9902	412-761-8998	www.schaffnermfg.com
SERFILCO, Ltd.	31	800-323-5431	847-559-1995	www.serfilco.com
SME Finishing '99	47	800-733-4763	313-271-2861	www.sme.org
Surface Coating Industries Corp.	13	877-507-4SCI	905-507-2SCI	
3M Company	4 th cover	800-742-9546	800-852-4668	www.3m.com/integratedsolutions
Veeco Instruments Inc.	21	888-24-VEECO	516-738-9329	www.veeco.com
Water & Wastewater Equipment Co. ..	105	440-942-7070	440-942-3622	
Zero Discharge	31	413-592-4242	413-592-4004	