

Contents

Volume 74 1996

FOUNDED 1925

Published Bi-monthly

Editorial contents copyright by Institute of
Metal Finishing

EDITORIAL OFFICE:

EXETER HOUSE
48 HOLLOWAY HEAD
BIRMINGHAM B1 1NQ
Tel: 0121-622 7387
Fax: 0121-666 6316
E-mail ukfinishing@dia1.pipex.com

ADVERTISING OFFICE

EXETER HOUSE
48 HOLLOWAY HEAD
BIRMINGHAM B1 1NQ
Tel: 0121-622 7387
Fax: 0121-666 6316
E-mail ukfinishing@dia1.pipex.com

HON. EDITOR

J.P.G. Farr, BSc, PhD, FRSC, FIMF

HON. EDITOR EMERITUS

Simon Wernick, OBE, PhD, MSc, FRSC,
CChem, FIM, CEng, FIMF

MANAGING EDITOR

Clive Larson, BSc, MIMF

PRICE

Non Members £27.00 per copy or £130 annual
subscription (6 copies)

Typeset by Art Photoset Ltd., Beaconsfield.

Printed by Williams Press, Maidenhead

The Institute is not responsible for the statements made or the
opinions expressed by contributors to Transactions of the
Institute of Metal Finishing.
ISSN No: 0020 2967

Minutes of 1995 AGM	1
Presidential Address "Taking Stock - Taking Action", by D. R. Gabe	8
Forced convection mass transfer in electrodeposition cells - theoretical aspects - by A. F. Averill and H. S. Mahmood	11
Effect of steel surface composition on the structure and quality of phosphate coating, by N. C. Debnath and P. K. Roy	17
Electroless palladium plating from an ethylenediamine complex bath using phosphite as a reducing agent, by H. Nawafune, S. Mizumoto, M. Haga and E. Uchida	21
A new process of electroplating on titanium and titanium alloy for aerospace, by Zhang Jingshuang, Yang Zhelong, An Maozhong, Tu Zhenmi and Li Mengchu	25
Role of peptone in the electrodeposition of tin and tin-zinc alloys from neutral gluconate bath, by V. S. Vasantha, M. Pushpavanam, P. Kamaraj and V. S. Muralidharan	28
Internal stress and hydrogen permeability of zinc-nickel alloy electrodeposits, by M. Pushpavanam and K. Balakrishnan	33
Colour conversion coatings on zinc, by Han Keping and Fang Jingli	36
Electrochemical determination of corrosion protection properties of chromated zinc, zinc alloy and cadmium electroplated coatings, by Ts Dobrev, M. Monev, I. Krastev, W. Richtering, R. Zlatev and St. Rashkov	45
Experimental study of pulse with reverse platings on nickel-iron alloys from sulphate solutions, by K.-M. Yin and S.-L. Jan	51
Nickel electrocrystallization: influence of unsaturated organic additives on the mechanism of oriented crystal growth, by J. Macheras, D. Vouros, C. Kollia and N. Spyrellis	55
Organic antitarnish coating on nickel plate, by Han Keping and Fang Jingli	59
Uniform dispersibility of PTFE particles in electroless composite plating, by M. Nishira, K. Yamagishi, H. Matsuda, M. Suzuki and O. Takano	62
Electroless nickel plating - influence of mixed ligands, by S. M. Mayanna, L. Ramesh and B. S. Sheshadri	66
Preparation, formation and corrosion for Ni-W-P amorphous alloys by electroless plating, by Zhang Bangwei, Hu Wangyu, Qu Xuanuan, Zhang Quinlong, Zhang Heng and Tan Zhaosheng	69
Effect of some operating variables on the characteristics of electrodeposited Ni- α -Al ₂ O ₃ composites, by M. H. Fawzy, M. M. Ashour and A. M. Abd El-Halim	72
Modelling secondary current distribution in electrodeposition cells with the probabilistic method. Part 1 - theoretical development, by A. F. Averill	83
Effects of the iodide ion on acidic electroless nickel deposition, by Han Keping and Fang Jingli	88
A super high speed electroless nickel plating process, by Han Keping, Wu Yong, Zhang Min and Wang Jianhong	91
Immersion deposition of gold, by Han Keping	95
Electroless Ni-Cu/PTFE composite coatings, by Jiao-ning Tang and You-bei Xie	99
An assessment of cutting fluid performance and improvements in surface finish, by D. P. Upton	103
Structure, texture and properties of metallic multilayers deposited by a program-controlled pulse current method, by V. A. Zabudovsky, N. F. Fedotova and E. F. Shtapenko	106
Zinc manganese alloy electrodeposition by G. D. Wilcox and B. Petersen	115
Post passivate systems for zinc and zinc alloys, by P. McCluskey	119
Effects of copper foil type and surface preparation on fine line image transfer in primary imaging of printed wiring boards, by D. R. McGregor, B. L. Adams-Melvin and K. H. Deitz	124
Development of new electrodeposited copper foil, by G. Onfroy and M. Saida	133
Fabrication of nickel microbump on aluminium substrate using electrolessnickel plating, by H. Watanabe and H. Honma	138
New, long term alternative fluorosolvents for electronics cleaning and drying applications, by W. G. Kenyon	142
Modelling secondary current distribution in electrodeposition cells with the probabilistic method. Part 2 - variation of secondary current distribution on scaling up laboratory size model cells, by A. F. Averill	149
New aspects of zinc-nickel alloy codeposition, by V. G. Roev and N. V. Gudin	153
A new development for the electrolytic deposition of zinc-nickel alloy with 12-15% nickel from an alkaline bath, by R. Pfiz and G. Strube	158
On the mechanism of the AC electrolytic graining of rolled aluminium substrates, by P. Laevers, A. Hubin, H. Terryn and J. Vereecken	161
Influence of the Nd-laser irradiation on the phase composition and structure of iron alloys, by D. Stoychev, M. Bratoeva, M. Stoycheva and S. Giurkovsky	169
A rotating ring-disc electrode study of zinc electrodeposition from zincate solutions, by L. Mirkova, Ch. Tsvetkova and S. Rashkov	173
Non-uniform microdistribution of some alloys and their components on shaped and rough cathode surfaces, by S. C. Kruglikov, V. I. Kharlamov and T. A. Vagramyan, jr	189
Catalytic activity and stability of mixed PdCl ₂ /SnCl ₂ catalysts, by T. Fujinami, J. Watanabe and H. Honma	193
The influence of surface treatment on the durability of aluminium-epoxide lap joints. by D. M. Brewis and G. W. Critchlow	198
Advances in replacements for cadmium plating in aerospace applications, by K. R. Baldwin and C. J. E. Smith	202
Non-chromate conversion coating treatments for electrodeposited zinc-nickel alloys, by J. A. Wharton, G. D. Wilcox and K. R. Baldwin	210
Studies of porosity in electroless nickel deposits on ferrous substrates, by C. Kerr, D. Barker and F. C. Walsh	214
Some properties of electroless Ni-P, Co-P and Ni-Co-P deposits, by J. P. G. Farr and A. Abbas Noshani	221
The effect of brush plating on the structure and wear properties of electrodeposits, by J. Gering and J. P. G. Farr	226

<i>Transactions - technical notes</i>	
Aluminide diffusion coatings on Ni-base superalloys, by A. B. Smith and S. M. Ng	64
Formation of metastable phases in the process of electrodeposition of metals and alloys, by V. V. Povetkin and O. V. Devyatkova	177
Electroplating of nickel using a modified barrel design, by J. Rethinam, S. Sriveeraraghavan, S. Jayakrishnan, S. Sethumadhavan, S. Ramesh, V. Sriram and R. M. Krishnan	179

<i>Transactions - tutorials (coordinating editor Dr G. D. Wilcox)</i>	
Current versus potential studies for copper electrodeposition at a rotating disc electrode, by E. S. Man, E. E. Farndon, S. A. Campbell and F. C. Walsh	39
Process recycling and environmental treatment, by L. D. Brown	78
Instrumental techniques for the surface analysis of materials, by G. W. Critchlow	108
<i>Transactions - tutorials (coordinating editor Dr G. D. Wilcox)</i>	
The testing of electrodeposits. Part 1, by C. Bocking	182

Author and Subject Indexes	233
----------------------------------	-----

