FINISHING INDUSTRIES

A new journal incorporating Industrial Finishing, Surface Coatings, Electroplating and Metal Finishing, Metal Finishing Journal and Corrosion—Published by Wheat-land Journals Ltd., U.K.

Vol. I, No. 1 Jan. 1977.

GDR Electroplating Plant—" VEB Galvanotechnik Leipzig ". In German, the name says just about everything—' National Company, Electroplating Technology, Leipzig '. It is all there—status, function and location in a neat and orderly phrase. What the name does not say, however, is that VEB Galvanotechnik Leipzing (known as VEB GTL for short) is one of Europe's biggest manufacturers of electroplating plant.

In fact. the whole of the GDR's manufacture of electroplating plant is concentrated in this single undertaking. Moreover, it not only meets the domestic requirement of the GDR's own highly sophisticated and rapidly expanding industrial sector, but is also a major supplier of plant and chemicals to all the other member states of the Council for Mutual Economic Assistance (CMEA).

Self Limiting in Electrostatic Powder Coating—A Myth? by Dr. A. Cetronio. In work on powder coating systems the subject of self limiting frequently comes under discussion. The electrostatics group at Southampton University has, therefore, carried out tests to investigate this process. Some results have been published at the Institute of Physics Conference on Static Electrification in London in 1975 and others will be published at the Dechema Conference at Grenoble this year. The Paper represents a practical survey of some of the findings and their relevance to the coating industry.

Hydrogen Embrittlement in Medium and High Carbon Steels.—A paper read by G. E. Lukacs to the Australian Institute of Metal Finishing.

Vol. 1, No. 2, 1977

Coating Thickness Gauges: Instruments or Gadgets? by T.D.T. Latter—Numerous devices are available for measuring the thickness of coatings. Unfortunately most prospective users are not instrument specialists and often experince difficulty in selecting the best device for the application. Due to lack of knowledge or time, more-over, he is often placed in difficult position of being able purchase only in order to eliminate an immediate problem and therefore is not able to assess fully future or continuing needs in parallel to this immediate and urgent problem.

Abstracts

The object of this article is to provide a reasonably concise guide for the prospective user in selecting the best instrument for the job by making a series of simple comparative tests on apparently similar measuring devices. The list of tests also serves as an indication of the possible snags for the unwary. These tests are basically those carried out using highly sophisticated test instrumentation during the development of any instrument by the reputable manufacturer—otherwise how else can he write his specification data! However, the prospective user can select all or part of those tests most applicable to his particular problem. In most cases simple test pieces for the comparison test are simply produced. A little time and effort spent on initial tests, such as these, can prevent the erroneous purchase of unsatisfactory devices and the associated cost savings are self evident. In most cases it is essential that an instrument probe is mechanically brought into contact with a test piece, or test piece on to the instrument, so that positioning may be reproducible and characteristics repeatable. This is done using a mounting jig, to do otherwise merely adds an unsystematic operator error which can blanket all others.

Instrumentation in Eelectroplating—Instrumentation is essential for the effective operation and control of electroplating processes. On manual installations simple indicating instruments may be all that is necessary whilst on automatic plant more complex facilities are required which not only measure the solution temperatures, the plating current and voltage. the PH value, but also initiate the necessary adjustments so that the process is operated at the optimum conditions. The information provided in this article refers only to electrical control.

Instrument Review—Some instruments of use to practical platers and painters are discribed.

Powder Shows Cost Saving for Domestic Appliance Manufacturer—Smart & Brown (Engineers) Ltd, have been using powder for three years so they are in a position to assess accurately the advantages of using this method of coating domestic appliances.

Early Electroplating—Part I. Initial Developments (About 1800—1836) by Dr. C. A. Smith.—The first in a series of four articles reviewing the development of electroplating in the 19th Century.

Electrodeposited Silver and its Alloys by Mrs. Malathy Pushpavanam and B. A. Shenoi, CECRI, Karaikudi—Electrodeposition of silver and its alloys is of great interest because of the extensive use of material in electrical electronic and decorative field. Silver-plated surfaces are very much appreciated in bearings and for military appliances. The silver alloys are mainly used for the improved performances of the alloys in corrosion resistances. This work summarises the work carried out in silver and its alloy plating and their use in vairous fields. The first part of the paper deals with the deposition of pure silver and the second part with the alloys.

Vol. I No. 3 March 1977.

Electrodeposited Silver and its Alloys—Part II—Silver Alloys by Mrs. Malathy Pushpavanam and B. A. Shenoi, Central Electrochemicals Research Institute, Karaikudi, India.

Elelectrodeposition of silver and its alloys is of great interest because of the extensive use of the materials in electrical, electronic and decorative field. Silver-plated surfaces are very much appreciated in bearings and for military appliances. The silver alloys are mainly used for the improved performance of the alloys in corrosion resistance. This work summaries the work carried out in silver and its alloys plating and their use in vaious fields. The first part of the paper published last month dealt with the deposition of pure silver and the second part published here deals with the alloys.

Polyester Paint: Low Pollution, High Quality by Ken Johnstone. **Early Electroplating Part 2.** Commencent of Industrial Applications (About 1836—1852) by Dr. C. A. Smith, Principal lecturer, Stevenage College—This is the second in a series of four, reviewing the development of electroplating in the 19th Century. The first article considered the initial developments up to about 1836. It was primarily concerned with the early developments of the battery and how facsimiles of coins and medals were first procured.

Trouble-Shooting in the Plating Shop—Part 1. A General Outline by W. E. Pegram.

Anodizing Zinc, its alloys and Diecastings by Mrs. M. Pushpavanam and B. A. Shenoi, Central Electrochemical Research Institute, India. The anodic coatings of zinc are of present interest because of their improved corrosion resistance combined with attractive colours. It is proved that by anodising, colours like green, blue, brown, grey and black can be easily produced. So, in future, these coatings will certainly replace the conversion coatings and phosphate coatings. This review deals with all possible methods suggested for anodising zinc and their applications and limitations. Of all the known baths, the ac anodising bath, because of its unique properties, appears to be the most encouraging.

Vol. I., No. 5. May 1977

A Review of Spray Application Equipment for Water-Borne Paints M. Eaton, Managing Director, Kremlin Spray Painting Equipment Ltd. There are no great problems encountered when spraying water borne paints. When using electrostatic spray the method of charging must carefully be selected.

Trouble-Shooting in the Plating Shop—Part 2.—Defects and Probable causes by W. E. Pegram—The author continues his survey, begun last month, of defects found in electroplating and their probable causes.

Mechanical Plating: The Critical Parts Coating—A mechanical method of coating small parts with zinc and certain other metals is described. Known as mechanical or peen plating, it avoids hydrogen embrittlement fractures sometimes associated with electroplating and provides an exceptionally uniform coating. These properties make it ideal for finishing parts subjected to stress and threaded parts.

A New Cyanide-Free Alkaline High-Performance Bright Zinc Bath by Gerd Senge, Development Department—pilot plant, Schering A. G. Galvanotechnik—A detailed technical account of commercially available non-cyanide zinc plating process. It it a robust process giving a very bright deposit.

TIN AND ITS USES

1977 No. 111

The Chemistry of Eastertin Stabilisers- Dr J. W. Burley, Akzo Chemie U. K. Ltd., Liverpool—Although a wide variety of PVC stabilisers have been developed in recent years, by far the most versatile are organotin compounds. They impart superior heat stability and clarity to the PVC resin and, in spite of their relatively high cost, are therefore, often chosen in preference to the other classes of PVC Stabilisers. Futhermore they have the advantage that their performance is much less sensitive to variation in polymer type.

Lead-Calcium-Tin Alloys for the Lead-Acid Battery Part 2—Commercial Developments—P. M. Dinsdale, I.T.R.I.

PLATINUM METALS REVIEW

Vol. 21, No. 1. January 1977.

The Mechanism of Action of Anti-Tumour Platinum Compounds—by—A. J. Thomson School of Chemical Sciences, University of East Anglia, Norwich—A wide range of studies carried out by cell biologists and boichemists lead to the conclusion that platinum anti-tumour compounds exert their potency by stopping the replication of DNA, thereby preventing cell division. This is most likely achieved by the formation of a complex between the bases of the DNA and the platinum compounds. The exact nature of this binding is not yet understood.

Forming Fibres from Basalt Rock—New Application for a Well-Established Process—By Professor G. L. Sheldon, Department of Mechanical Engineering, Washington State University, Pullman, Washington.—Basalt, a rock which results when molten lava from deep in the earth's crust rises up and cools sufficiently to solidify is found in many parts of the world. In some notable instances it covers areas of many thousands of square miles. This paper described work carried out to produce commercially useful fibre from the basalt which occurs as an enormous outcrop in Idaho, Oregon and Washington in the United States of America.

Preparation of alumina supported palladum-platinum catalyst—A Novel Tribophysical Technique—by S. Yamaguchi—National Institute for Researches in Inorganic Materials, Sakura-mura Niihari-gun Ibaraki-ken, Japan —Economic considerations require that platinum metals and alloys used as catalysts should have a high surface to volume ratio, thus extremely small particles are required. This article described a tribophysical process for producing such particles uniformly dispersed on Alumina. The catalytic activity and life of the materials produced have been tested for the oxidation of hydrocarbon gas and the results are discussed.

GALVANOTECHNIK

Vol. 68 , No. 2, February 1977

S Lohmeyer. Korrosion Nichtrostender Stable—Corrosion of Stainless Steel—Galvanotechnik (Saulgau/Wurtt) 68 (1977) 2, S. 114-122.

Stainless steel can undergo many types of corrosion. In this article the most important causes of failures such as alloying constituents, of cooling faults, wrong tempering, chemical attack, deformation, poor welding and many other influences are discussed.

R. Kammel /H. W. Lieber—Possibilities of Treating Electroplating Effluents without the Formation of Residues Metal Recovery in Place of Sludge Disposal, part ii—68 (1977) 2. S. 123-130.

The formation and settling of electroplating sludges can only be regarded as a policy of necessity. Future developments lie in the direction of preventing the occursence of such sludges, and the recovery of the metals and materials present. Since December 1975, a programme bas been instituted under the direction of the Federal Ministry for Research & Technology which covers effluent problems. The objective is to develop effluent free electroplating. The series deals with the means by which effluent problems can be resolved by avoiding the production of sludges, with particular emphasis on the recovery of materials.

W. H. Guhring—Quality Control of Corrosion Protection Coatings of Aluminium Components-68 (1977) 2, S. 131-140, 20 Abb., 10 Lit-Hinw.

The methods and apparatus described in this article are non-destructive. The measurement of deposit thickness, and the processes used for the sealing of anodic coatings are discussed. A method of testing the alloying constituents of aluminium is discussed, since the same composition of aluminium is a pre-requisite for the same nature and quality of anodising and dyeing.

Repotage von K. P. Binanzer—Production of Super-pure parosmose inverse 68 (1977) 2. S. 141-145, 6 Abb—In this report the introduction and use of reverse osmosis at the siemem AG plant in Regensburg is described. For the manufacture of semi-conductors and other components a supply of water of the highest purity must be available. This can be achieved by the use of reverse osmosis.

Vol. 68, No. 3, March 1977.

R. Lindau—Is the use of Silicate-containing Cleaning Baths still essential from the Effluent Treatment Point of View? Galvanotechnik (Saulgau Wurtt.) 68 (1977) 3, S. 229-2311. 7 Tab. This investigation was designed to establish whether silicate containing cleaning solutions hinder the precipitation of metal hydroxides in effluents. It appears that settling is improved. Excessive amounts of silicate-containing cleaning solutions, however, have a gelling effect on the effluent waters. Dilution during discharge is therefore necessary. The alkali content can be useful for the neutralisation of acids.

A. C. Hart/A.C. Warner—Anodes in Nickel Plating Galvanotechnik (Saulgau/Wurtt) 68 (1977) 3, S, 232-239, 10 Abb., 22 Lit.—Hinw.) The influence of bath temperature; boric acid content of the solutions, and of brighteners on the anodic dissolution of activated nickel is investigated. It has been found that the dissolution is sulpher-free nickel cannot be appreciable improved by changing the bath temperature; this is only possible by the incorporation of very small amounts of sulphur in the nickel.

Electrolysis of Waste Water and Ion Exchange.-Galvanotechnik (Saulgau/Wurtt) 68 (1977) 3, S. 241-251 Versch. Abbildungen.

Report on conferences on waste water in Essen and Esslingen. The formation and settling of electroplating sludges can only be regarded as a policy of necessity. Future Developments lie in the direction of preventing the occurence of such sludges, and the recovery of the metals and materials present. Since December 1975, a programme has been instituted under the direction of the Federal Ministry for Research & Technology which covers effluent problems. The objective is to develop effluent-free electroplating.

Vol. 67., No. 11, November 1976.

A. F. Bogenschutz—Alloys which can be electrodeposited for Electronic Applications—67 (1976) 11, S. 875-887, 14 Abb., 1 Tab , 40 Lit.—Hinw. At the time more than 250 different alloy systems can be deposited electrolytically. Even though only a certain number of these have found technical applications, the more rarely used precious metals, for example, are wholly or partly replaced by alloys. The fundamental principles of alloy deposition and the alloys of current special interest which can be electrodeposited are discussed with particular reference to their fields of application.

H. Gerstberger—Possible Defects in Electroplating in the Manufacture of Printed Circuits—67 (1976) 11. S, 894/895—Defects which may occur in electroplating in the manufacture of printed circuits, and their causes, are discussed

K. A. Egerer—Further Developments in the Additive Technique for Printed Circuits—67 (1976) 11, S. 896-907 6 Abb— As a result of recent developments in the production of printed circuits, it is now possible to employ a combination of substractive and additive processes. This is described in the article. Dr Egerer is Vice-President of Photocircuits and its German Representative Automatic bath control methods, the use of banding agents, activation systems, printed circuits with metal cores, the multi-wire technique and photoforming processes are described.

A. Kondier—Deposition of Alloys in Electroplating Baths—Report of a paper given by Dipl.Ing. A. Knodler, Schwab, Gmund in Vienna—67 (1976) 11, S, 910 911.—The deposition of metallic coatings from alloy baths is more difficult than is the case from pure metal baths. The essential condition for the simultaneous deposition of several metals is that the deposition potentials should be closed together. Inhibitors can even be employed to achieve this. The various alloys mainly concerned are dealt with.

GOLD BULLETIN

Vol. 1 No. 1 , January 1977

Alloy Gold Deposits for Electronic Applications—An Evaluation of The Gold-Copper-Cadmium Sulphitesystem W.A. Fairweather–Although processes for the electrodeposition of alloy golds have been available for some years, they have so far found few applications in the electronics industry. This article, based in part on a paper presented to the Ninth World Congress on Metal Finishing held in Amsterdam in October, first reviews the literature on the numerous alloy gold systems available and then gives an assessment of the particular process considered by the author to be the most satisfactory.

Gold in Hybrid Microelectronics—A Review of The Vancouver Conference—David T. Wall, Lucas Aerospace Ltd., Birmingham, England—The International Society for Hybrid Microelectronics held its 1976 International Technical Symposium in Vancouver British Columbia, in October The conference comprised twelve session on various aspects of microelctronics, with speakers from the U. S. A., Canada, Great Britain and several European countries. A number of these papers dealt with the use or the behaviour of gold in the fabrication of thin and thick film circuit assemblies.

Gold Plating of Titanium and its Alloys-A New Pretreatment Procedure.

METALS AUSTRALIA

Vol 8., No. 9., October 1976

Welding Research in Australia—by T. M. Miller and A. Vetters—Research Metallurgist and Director, Australian Welding Research Association. INTRODUCTION: Welding Research, if it is to be comprehensively carried out requires the utilisation of a number of scinetific disciplines. Perhaps this reason, more than any

other, is responsible for the decentralisation, or even fragmentation of research in this field. In Australia the costs involved in establishing a centralised facility capable of providing broad research coverage would be prohibitive. Additionally it is doubtful if sufficient return on investment could be achieved to justify such expenditure. This paper discusses the current situation with respect to welding research and endeavours to underline those areas which require attention if the industry is to derive maximum benefit from research investment.

Ultrasonic Inspection of Weldments—by R. S. Gilmour, Country Roads Board of Victoria—INTRODUCTION: As an inspection technique ultrasonic testing has been used by the welding industry for some twenty years. In that time ultrasonic equipment developments have occurred in areas where repetitive high volume automatic ultrasonic inspection is possible, e.g. the production of welded pipe and tube. However, "jobbing" ultrasonic weld inspection is still done manually. The ultrasonic technician in some places is still treated with scepticism and if no defect is found on gouging in the indicated spot the technician still loses credibility.

Applications in Hardfacing—by C. V. Whitehouse Joint Managing Director, Vida-Weld Pty Ltd.,—SYNOPSIS: An awareness of at least some of the practical considerations can be extremely important in the decision to hardface a particular component. Background in formation such as life of the unprotected component, extent of wear over a period, duration of that period, size of the part, base metal composition, weldability are all points that should be considered carefully in determining the feasibility and method to be used in hardfacing. Failure to recognize the importance of the points mentioned may just as surely ensure failure of the part hard faced as other important considerations, resulting in unjust criticism of hardfacing as an application.

ANTI-CORROSION

Volume 24, No. 1, January 1977.

The Corrosion Story—Part 2: Copper and Brass by Dr C. A. Smith, C.Eng. FIMechE, Principle Lecturer Stevenage College.

Effect of Tin Addition on the Corrosion Resistance of Aluminium Bronze by Zaki Ahmad—Department of Metallurgical Engineering, Arya-Mechr University of Technology, Tehran, Iran.

Abstract: Tin addition to Cu-7% Al in presence of 1% Fe and 1% Mn increases the corrosion resistance in HCl H_2SO_4 NaCl and Sea Water. Tin addition in the absence of Fe and Mn causes embrittlement of the Cu-7% Al alloy. However, in presence of Fe and Mn the alloy shows outstanding mechanical properties. Tin addition retards the anodic dissolution of oxide film and retards dealuminification. The corrosion resistance of the alloy could be increased by various heat treatments. Quenching from 650°C appears to be the most effective treatment. A high proportion of alpha phase and a greater dispersion of beta improves the corrosion resistance. The alloy developed could be used with advantage in heat exchange equipment and in various other marine applications.

Vol 24 No. 2, February 1977.

Nickel Alloy Solves Immersion Heater Corrosion In Aggressive Water* Redring Electric Ltd., of Peterborough, a subsidiary of GEC Ltd., has developed a range of long-life domestic immersion heating elements called 'Aqualoy 825'. These elements are for use in any locations where the normal copper sheathed element is unable to cope with aggressive water. The basis of its success is a sheath of INCOLOY alloy 825, manufactured by Henry Wiggin & Co. Ltd.

Stainless Steels and Nickel Alloys in Anti-Corrosion Service.

The Corrosion Story Part 3: Zinc, Lead and Aluminium—By Dr. C.A. Smith, C.Engg, FIMechE, Principle Lecturer, Stevenage College.

GALVANIZING. No. 17.

Preserving Galvanized Steel and Zinc from Wet Storage Stain—A. R. Cook. ABTRACT: Galvanized articles can be heavily attacked by a form of corrosion known as wet storage stain or white rust when stored or transported under unsuitable conditions. This article deals with the occurrence of wet storage stain, its cause, methods of prevention, recommendations for transport and storage, details of pretreatnents and techniques for repairing any damage which may have occurred.

Electrogalvanizing of Mill Steel Wire with a Non-Cyanide Alkaline Bath—I. T. Kamat, P. S. Kinnerkar and

*This article originally appeared under the title "Go— Buywhere Heating Elements" in the publication Wiggin Nickel alloys 1, 2, published by Henry Wiggin & Co, Ltd., Holer Road, Herefond 'HR 4 9SL.

D. L. Roy—ABSTRACT: The present investigation is an attempt to develop a suitable non-cyande alkaline electrogalvanizing bath for the wire industry. The effects of sodium hydroxide, zinc oxide, concentrations in the bath, mechanical as well as ultrasonic agitation, and influence of addition agen's have been studied. The optimum conditions for electrogalvanizing of wire using a non-cyanide alkaline bath have been evaluated. A possible mechanism for zinc deposition from this bath has also been proposed.

Adodizing of Galvanized Products—Roger E. Marce and L. M. Weisenberger. ABSTRACT: This article deals with anodized zinc., a non-reflective, functional type coating, anodized zinc, which exhibits excellent resistanee to corrosion, wear, abrasion, heat and electrical conduction on galvanized articles, is compared with chromate coating. The different types of anodized, zinc, the processing conditions and advantages are discussed in detail.

AUSTRALASIAN CORROSION ENGINEERING

Vol. 20, No. 8/9—Aug/Sept 76

Eddy Current Inspection of Heat Exchanger Tubes—G. R. McCASLAND **Araldite in Formica Printed Circuit Material**—To Most people, the name Formica immediately conjures up thoughts of decorative heat-resisting surfaces in kitchens, and it may not be generally appreciated that Formica Limi ed is also a leading manufacturer of laminates for printed circuit boards and for electrical installation This article describes the production of these laminates and the part played by CIBA-GEIGY'S araldite epoxy resin in the process.

BATTERY NO. 4.

A Practical Castability Test for Battery Grid Alloys I. W. R. White and P. Rogers—ABSTRACT. The published literature relating to castability and fluidity tests for metals is reviewed and a description is given of the modifications made to improve the reproducbility of results obtained using the appraratus of Mao and Larson. The effects on castabitity and age-hardening by additions of arsenic and or tin to antimonial lead alloys are studied. The effects on castability of copper and bismuth as impurities in antimonial lead alloys are also examined.

Reclamation of Scrap Batteries: Lead batteries constitute about 45% of the total consumption of refined lead. It is forecast that if present trends continue this percentage will go up to 50% in 1980 and 60% in 1985. It is therefore, in the interest of scrap processors and manufacturers that recycling of batteries should be technically simple and environmentally acceptable. There are many difficulties in processing lead batteries as a result of the unusually heterogeneous construction of the batteries and the materials used, some of which behave unfavourably during processing. Different processes for treatment of scrap betteries are examined in this article which is a condensed version of the paper presented by Dr. Herbert Dlaska of Bleiberger Bergwerks Union, Austria during the recent 5th International Lead Conference in Paris.

Shelf Life of the Dry Cell: The requirements of the zinc anode of the Leclanche cell are that it should not corrode when not in use (open circuit) and it should dissolve uniformly and with 100% current efficiency when in use (closed circuit). The occurence of pitting is especially detrimental since it leads to poor utilisation of zinc, premature perforation of the can and leakage of the corrosive electrolyte. In this article Dennis B Mathews of Flinders University, Australia, examines the conditions under which the zinc anode of the Leclanche cell is corroded.

BATTERY No. 6.

Traction Battery: Abstract: Battery which provides motive power for on-the-road and off-the-road vehicles is known as traction battery, Traction batteries are mainly used today in commercial road vehicles, industrial trucks, delivery vans, milk floats and post office vans. In particular, the battery-powered trucks are at present icreasingly used in factories, warehouses, supermarkets, etc., In UK alone about 60% of industrial trucks are powered by batteries while in other countries the demand is catching up. The traction battery has assumed great importance in the present context of the energy crisis which has shifted the emphasis in favour of battery-powered transportation systems. In this article the basic design features of two types of traction batteries are briefly reviewed.

Lead-calcium-tin Alloy-properties and prospects—M. V. Rose & J. A. Young. The Properties of this new alloy and the prospects for application in the lead battery industry are reviewed in this paper.

High efficiency Lecalanche cells-Brooke Scheme, Jr. ABSTRACT: The Electrochemistry of Leclanches cells as well as the ion movement accompanying cell discharge is briefly reviewed. Alterations of the separator markedly affect this movement, increased separator thickness and electrolyte volume is shown to bring about a significantly higher cell efficiency and a reduction in undesirably post discharge effects.

AUSTRALIAN CHEMICAL ENGINEERING

Vol. 17, Nos. 8/9. Aug/Sept. 1976.

Treatment of water and effluent: air floatation namelled exhaust silencers.

CIRCUIT WORLD

Vol. 2 No. 2 Janury 1976.

Measurement and control of coating thickness and porosity in printed wiring manufacture—part II—T. D. T. Latter.—Control of electroless deposiiion: Both electroless and some etectroplating processes can be monitored during the deposition process using a recently developed probe for the Betascope beta backscatter coating thickness system (described in more detail later). As the probe is inserted into the bath electrolyte it can result in some cases, in a masking effect being produced with the electrolytic processes (depend ing upon the charactertstics of the bath solution bath load distribution and anode/cathode ratio), but in general terms no such effect is apparent in electroless solutions Thus the theoretical deposition rate can be cross-checekd by the actual practical rate by direct thickness measurement.

Vol. 3. No.2., January 1977.

Solders Solderable finishes and reflowed solder coatings—M. L. Ackroyd & C. A. Mackay.

Troubleshoot ing in the electroless copper process—Frank E, Stone.

MINERALS AND METALS REVIEW.

Vol. 2 No. 5 December 1976.

Conserving energy resources—By S. B. Budhiraja.

Vol. 2 No. 6, January 1977.

The use of micro organisms—By B. R. Sant.

Vol. 2 No. 8., March 1977.

Outlook for base Metals.

JOURNAL OF INDIAN INSTITUTE OF SCIENCE

Vol. 58, No. 12, December 1976.

Bacterial leaching of copper from low grade chalcopyrite ores E. G. Srinath, M. K. C. Sridhar and S. C. Pillai (Dept. of Biochemistry IISc., Bangalore) Received on October 19,1976 and in revised form on December 15,1976. ABSTRACT: A brief account is given of the observations on the occurrence of the species of Thiobacillus in the shaft water near the mines at Ingaldhal (Karataka State), its isolation, cultivation and utilization, on a laboratory scale, in leaching out copper from low grade chalcopyrite ore. In the experiment conducted from 40 lbs of the ore containing 0.6 percent copper, 18 grains of copper (Cu) was obtained. These and other observations indicate the possible utilization of this and similar organisms in the commercial production of copper from low grade chalcopyrite ores occurring in large quantities in Karnataka State and elsewhere. Keywords: Bacterial leaching, Chalcopyrite ore copper.

METAL FINISHING

Vol 75, No. 2, February 1977.

Technical Development in 1976-Inorganie (Metallic) Finishes, Processes and Equipment—By Nathaniel Hall Editor.

Technical Development in 1976—Organic (Paint) coatings. Processes and Euqipment—By Jeseph Mazia, Organic Finishing Editor.

The Geometry of Plating Baths—Part Four—Custom Plating Containers By J. B. Mahler, Kent, Wash.

Vol. 75 No. 3, March 1977.

Techniques for quantitatively measuring adhesion of coatings—By J. W. Dini & H. R. Johnson, Metallurgy & Electroplating Div., 8312, Sandia Laboratories, Livemore, Calif.

History, current status and future developments of exterior vacuum metalizing—By Charles C. Storms, President Red Spot Paint & Varnish Co. Inc. Evansville, Ind.

Silicon-controlled Rectifiers—By Stanley Chait—Trilectron Ind. Inc. New York, N. J.

Solution Vinyls for metal finishing—By Dean M. Berger, Coating Specialist, Gilbert/Commonwealth, Reading, Pa

Vol. 75 No. 4 April 1977.

Pretreatment for water-borne coatings—by Mark A. Kuehner, Amchem Prod Inc Ambler, Pa.

Nickel-Aluminium oxide composite coatings—By Mrs. Malathy Pushpavanam and B. A. Shenoi, Central Electrochemical Research Institute Karaikudi, India.

Techniques for quantitatively measuring adhesive coatings—By J. W. Dini & H. R. Johnson, Metallurgy and Electroplating Divn., 8312, Sandia Laboratories,

Livermore, Calif—This is the second half of the article on measuring adhesion of coatings. The first half appeared in the March Issue

Transion from rughing to diffusion pumps—By M. Hablanian & P. Forant.

ZINC ALLOY DIE CASTING SOCIETY No. 24

Anodizing of zinc—die castings—Roger E. Marce and L. M. Weisenberger. ABSTRACT: The anodized zinc process produces a surface on zinc which offers a number of improvements. Anodized zinc exhibits exceptional resistance to corrosion, wear, heat, abrasion, and electrical conduction on zinc die castings, as well a, on gravity cast zinc. The film is formed by immersing properly recked parts in a simple electrolyte and applying an increasing voltage for up to 10 min. A non-reflective, functional type coating, as opposed to a bright decorative, coating, anodized zinc shows improvement in all properties when compared to chromate conversion coatings. The anodized zinc coatings range from 0.025 to 0.033mm (1.0 to 1.3 mil) in thickness and will not deteriorate up to the melting point of zinc. Although the cost of producing the anodic coating is greater than for producing the chromate conversion coating, there is more than a tenfold improvement in corrosion protection, based on salt spray test results. Uses for anodized zinc are growing, and these are many potential applications in test or awaiting evaluation.

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SUPPLIERS OF PRE-TREATMENT CHEMICALS OF WORLD RENOWN