L-59-4-37

October 1959

Distribution of this document is unlimited.

ELECTROLESS DEPOSITION OF COPPER AND NICKEL ON PLASTICS 1947-1959; A BIBLIOGRAPHY

Prepared by: T.P. Peck
T.P. Peck
Reference Librarian

Approved by: L. Canter
L. Canter
Chief Librarian

5

ELECTROLESS DEPOSITION OF COPPER AND NICKEL ON PLASTICS 1947-1959; A BIBLIOGRAPHY

Prepared by T.P. Peck

Astronautics Library

ARTICLES

Brinkmann, C. Copper plated laminates for printed circuits. *Kunststoffe*, v.48, n.12, December 1958, p.575-577. (In German)

Brownlie, D. Metal spray coatings for metals and plastics. Canadian *Metals and Metallurgical Industries*, v.12, June 1949, p.27-28.

Campbell, J. Finishes for plastics. *Materials and Methods*, v.41, n.6, 1955, p.119-134.

Collier, J. Metallized circuits. *Product Engineering*, v.19, n.4, April 1948, p.141-143.

Drummer, G. British developments in embedded and printed circuits. *Electrical Manufacturing*, v.51, n.5, May 1953, p.84-92.

Elser, F. Metallizing of nonconductors. *Metalloberfläche*, v.8, 1954, p.A107-110; p.A126-127. (In German)

Etched wiring grows: copper clad laminated panels. *Electronic Industries*, v.17, June 1958, p.457-462.

Gutzeit, G. Chemical nickel plating. *Corrosion Technology*, v.3, 1956, p.331-336.

Gutzeit, G. An outline of the chemistry involved in the process of catalytic nickel deposition from an aqueous solution. *Plating*, October 1959, p.1158.

Hannahs, W. Etching - a general fabrication technique. *Radio-Electronic Engineering*, March 1952, p.7-9, 31.

Heritage, R. Metallizing of glass, ceramic and plastic surfaces. *Metallurgia*, v.47, 1953, p.171-174.

Keating, J. Methods of coating plastics with metals. *Metal Finishing*, v.53, n.9, September 1955, p.75-78, 85.

Keil, A. The manufacture and testing of Noble metal films on insulators. FTZ-Fernmeldetechnische Zeitschrift, v.6, February 1953, p.73-77. (In German)

Kramer, O.P. Metallic coatings on nonconductors (plastics). Metallwaren-Industrie und Galvanotecknik, v.48, December 1957, p.516-520. (In German)

Lebens, J. Three metallising techniques for component design. Electrical Manufacturing, v.43, n.2, February 1949, p.120-125; 196-198; 200,202, 204.

Manfield, H. Etched foil printed circuits. Wireless World, v.61, n.9, September 1955, p.436-440.

Metal coating for plastics. Plastics, v.18, July 1953, p.248-250.

Metallized plastics expanding into new fields. Modern Plastics, v.34, May 1957, p.252.

Metallizing (making conductive) of glass and synthetics. Metalloberfläche, sec. b, v.2, January 1950, p.9-11. (In German)

Narcus, H. The deposition of metals on plastics employing reduced copper films. American Electroplaters Society. Proceedings, v.35, 1949, p.157-168.

Narcus, H. Metallization of plastics. Society of Plastics Engineers. Journal, v.9, March 1953, p.26-29.

Narcus, H. Practical copper reduction on nonconductors. Metal Finishing, v.45, n.9, 1947, p.64-67, 70.

New, hard nickel deposited on a plastic sheet. Steel, v.142, April 28, 1958, p.115.

Ollard, E. Deposition of metal on plastics. Plastics (London), v.10, 1946, p.470-475, 506; 527-530, 551; 604-608.

Pearlstein, F. Electroless nickel deposition. Metal Finishing, v.53, August 1955, p.59.

Prugh, T. The diamond ordnance fuze laboratories microelectronics program. Institute of Radio Engineers. Proceedings, v.47, n.5, May 1959, p.882-894.

Rider, D. Foil clad laminates in printed circuitry. Metal Progress, v.74, September 1958, p.81-85.

Rinker, E. Improved baths solve lifting of plated circuit foils. Iron Age, v.181, June 19, 1958, p.118-120.

Saubestre, E. Chemical problems in printed wiring. Industrial Engineering Chemistry, v.51, n.3, March 1959, p.286-287.

Saubestre, E. Copper etching in ferric chloride. Industrial Engineering Chemistry, v.51, n.3, March 1959, p.288-290.

Skow, N. Metal clad laminates used in printed circuitry. Society of Plastic Engineers. Journal, v.9, n.7, September 1953, p.9-12.

Springer, R. Metallizing of plastics. Kunststoffe, v.42, 1952, p.354-355. (In German)

Sullivan, M. Electroless nickel plating for making ohmic contacts to silicon. Electrochemical Society Journal, v.104, July 1957, p.226-230.

Tour, S. Modern developments in metallizing. Welding Journal, v.31, 1952, p.199-207.

Wein, S. Formation of copper films on nonconductors - a survey. Metal Finishing, v.46, n.8, 1948, p.58-60, 69.

BOOKS

Hepburn, F. The metallization of plastics. N.Y., Interscience, 1950.

Hepburn, J.R. The metallization of plastics. London, Cleaner-Hume Pr., 1947.

Metallizing handbook. N.Y., Metallizing Engineering Co., 1951.

Narcus, H. "Metallizing nonconductors" in Metal Finishing Guidebook Directory, p.430. N.J., Metals and Plastics Publications, 1959.

New advances in printed circuits. U.S. Bureau of Standards - Miscellaneous Publication 192, November 22, 1948.

PATENTS

Brazier, L. Chemical nickel for printed circuits. British Patent. 806,977. Metal Finishing Abstracts, January-February 1959, p.19.

Brazier, L.G. Chemical nickel for printed circuits. British Patent 806,977, December 7, 1958. Metal Finishing Abstracts, January-February 1959, p.19.

Deakin, S. Coating of plastic material. U.S. Patent 2,837,772, June 10, 1958. Chemical Abstracts 21230d, 1958.

General Electric Co., London. Chemical plating of printed circuits. British Patent 813,693. Metal Finishing Abstracts, July-August 1959, p.138.

Homer, H. Metallized plastic film. U.S. Patent 2884,337. Metal Finishing Abstracts, May-June 1959, p.98.

Kimiyoshi K. Metal plating on nonconductors. Japanese Patent 4104. Chemical Abstracts 1953, 2403F.

Korneeva, I. Solution for chemical copper plating of plastics and other dielectrics. Russian Patent 113 907, December 25, 1951. Metal Finishing Abstracts, May-June 1959, p.99.

Saubestre, E. Deposition of copper on electrically nonconducting substrates. U.S. Patent 2,872,359. Chemical Abstracts 6982, 1959.

Toumlin, E. Printed circuits by vapor deposition of metals. U.S. Patent 2,847,330, August 12, 1958. Chemical Abstracts 19885g, 1958.