Vacuum Applications

30. Evaporation and Sputtering

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53. Checkerboard domain patterns on epitaxially grown single-crystal thin films of iron, nickel and cobalt. (*U.S.A.*)
H. Soto, *et. al.*, *J. Appl. Phys.*, **34** (4), Part II, April 1963, 1062.

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54. Electron ejection from tantalum by singly ionized helium. (*U.S.A.*)
A. B. Laponsky, *J. Appl. Phys.*, **34** (5), May 1963, 1568.

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55. In-pile hall coefficient and conductivity measurements on zone refined *p*-type silicon. (*U.S.A.*)
G. C. Bailey and C. M. Williams, *J. Appl. Phys.*, **34** (7), July 1963, 1935.

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56. Ion-bombardment etching of synthetic fibres II. (*U.S.A.*)
F. R. Anderson, *J. Appl. Phys.*, **34** (8), Aug. 1963, 2371.

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57. Techniques for sputtering single and multilayer films of uniform resistivity. (*Great Britain*)
The need for increasing by more complex equipment involving the sputtering of multiple films has led to the development of a multiple cathode sputtering system, in which the substrates are fixed and the cathode assembly rotates, instead of vice versa. Some applications of this system to resistive films are described. (*U.S.A.*) (Authors)
L. I. Maissel and J. H. Vaughn, *Vacuum*, **13** (10), Oct. 1963, 421–423.

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58. In-line planar thin film cryotron. (*Great Britain*)
A. E. Brennemann, *Proc. Inst. Rad. Engrs.*, **51**, Mar. 1963, 442–451.

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59. Cadmium sulphide unipolar surface transistor. (*Great Britain*)
J. E. Kauppila, *Proc. Inst. Rad. Engrs.*, **51**, Mar. 1963, 472.

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60. Light scattering from dielectric-film laser mirrors. (*Great Britain*)
W. A. Specht, *Proc. Inst. Rad. Engrs.*, **51**, Apr. 1963, 615.

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61. Cadmium selenide thin film transistors. (*Great Britain*)
F. V. Shallcross, *Proc. Inst. Rad. Engrs.*, **51**, May 1963, 851.

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62. On the characteristics of cylindrical thin-film parametrons. (*Great Britain*)
B. A. Kaufman and W. Pfeiffer, *Proc. Inst. Rad. Engrs.*, **51**, May 1963, 855.

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63. Current-controlled negative resistance in thin films of niobium, tantalum and titanium oxides. (*Great Britain*)
K. R. Chopra, *Proc. Inst. Rad. Engrs.*, **51**, June 1963, 941.

30 : 56

64. Metal-film resistors. (*Great Britain*)
Anon., *Electron. Equip. News*, **5**, Oct. 1963, 28.

30 : 41

65. Continuous vacuum processing line. (*U.S.A.*)
The Engineering Centre of Western Electric Company have developed a continuous vacuum-process unit for sputtering tantalum thin films. The various steps in the process take place in sequence and without interruption in a series of chambers maintained at constant and progressively lower vacuum. A conveyor moves the substrate from air into the chambers, through the chamber and back into air again. Preheating, outgassing, pre-sputtering, sputtering and cooling are carried on, all at the same time as the glass or ceramic substrates loaded on to the conveyor follow one another through these steps, the production speed being of the order of 50 in. of tantalum film 1 min. (*U.S.A.*) W. J. S.
Anon, *Research & Devel.*, **14** (6), June 1963, 54–47.

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66. Vacuum evaporation of substances on to thin organic films. (*U.S.S.R.*)
In order to transfer heat from a thin organic film on to which a film of some high melting point substance is being evaporated in vacuum, the organic film is glued with shellac to a light duralumin ring (50 × 40 × 0.5 mm). The ring with the film is then placed under a glass bell jar, on to the polished end of a 24 mm dia. brass cylinder. After evacuation of the bell jar to 10^{-1} torr, the film is charged by means of a weak glow discharge (potential about 1500 V). This causes sufficient adhesion of the film to the brass to retain both ring and film in position when the brass support is turned upside down ready for the application of the substance to be evaporated. Removal of the film from the brass cylinder is facilitated if the latter is coated with a thin layer of rock salt (about 50μg/cm^2) before the organic film is placed in contact with it. With a thicker salt film ($> 200\mu g/cn^2$) the adhesion of the organic film is not sufficient to hold it when the brass support is turned upside down. (*U.S.S.R.*) A. H. T.
A. I. Baranov, *et al.*, *Instrum. & Exper. Techn.*, (5), May 1963, 1035–1037 [Transl. from *Pribory i Tekh. Eksp.* (5) Sept./Oct., Oct., 1962].

31. Evacuation and Sealing

31 : 56

67. Cathode-ray tube research. (*Great Britain*)
Work at the Royal Radar Establishment is described. *Brit. Commun. & Electron.*, **10**, Sept. 1963, 696–701.

31 : 23

A demountable electron tube for high vacuum applications. See Abstr. No. 48.

33. General Physics and Electronics

33 : 56

68. Analysis of the arc mode of operation of the caesium vapour thermionic energy converter. (*Great Britain*)
An analysis of the caesium vapour discharge is presented. It is assumed that the discharge operates in the ball-of-fire mode, that cumulative ionization via the two resonance excited states is the predominant ionization mechanism, and that trapping in the plasma of the resonance radiation results in a long effective lifetime of the excited states. A volt-ampere characteristic is derived from the caesium arc, and the results are applied to the thermionic converter. Good qualitative agreement is obtained between theory and experiment. (*U.S.A.*) (Author)
K. G. Hernqvist, *Proc. Inst. Rad. Engrs.*, **51**, May 1963, 748–754.