

ELECTRON BEAM DEPOSITION OF CERAMICS ON POLYPROPYLENE IN THE FOREVACUUM PRESSURE RANGE*

A.S. KLIMOV¹, I.YU. BAKEEV¹, V.T. TRAN¹, A.A. ZENIN¹

¹ *Tomsk State University of Control Systems and Radioelectronics, 40 Lenin ave., Tomsk, 634050, Russia*

Currently, polymers are widely used in many areas of industry. This is possible due to the many advantages over other materials. In particular, polymers are relatively easier to produce, cheaper, easier to use materials with high insulating properties. However, they have disadvantages due to their structural properties (lower hardness and durability, weak adhesion), insufficient gloss [1]. To solve this problem, the application of protective metal or ceramic coatings on the surface of polymers is practiced [2, 3].

At present, electron beam evaporation is recognized as one of the best methods that provides a set of necessary coating properties in combination with a high deposition rate and processability of operations. This paper presents a study of thermal heating modes of polymer substrates located at different distances to the evaporated ceramic target. A forevacuum plasma electronic source was used to vaporize ceramics [4]. The peculiarity of the source is the possibility of direct processing of non-conductive materials, in particular glass, ceramics, polymers [5]. The ceramic target made of aluminum oxide was heated to the evaporation temperature and the evaporation products were sprayed onto polymer substrates. The dependences of the coating growth rate on the deposition time, target temperature and distance to the polymer substrate are obtained. As a result, coatings with a thickness of up to 0.1 microns were obtained. The prospects of electron beam evaporation of ceramics for coating polypropylene are shown.

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