

MAIN FACTORS AFFECTING THE STRUCTURE AND PROPERTIES OF TITANIUM AND COBALT ALLOYS MANUFACTURED BY THE 3D PRINTING¹

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Development of techniques for manufacturing finished parts from titanium alloys using additive technologies are relevant at present for both scientific and industrial purposes. Methods of 3D printing are very promising, especially for medicine, because they allow you to obtain details of complex designs and take into account the personal characteristics of the human body. When constructing parts in installations using additive technologies (selective laser fusion, selective laser synthesis, electron beam fusion), a number of characteristics are important, including the parameters of the used installation (for example, laser power), the quality and size of the powder, the distance between layers, substrate surface quality, substrate temperature, etc. [1-2]. All of this will affects the porosity, the level of residual stresses and the structure of the material, which, accordingly, determines its mechanical properties [3-4]. Additive technology is a novel surface engineering technique, which allows us to obtained Ti-6Al-V alloys with high density (about 99.9%) as cast materials [2].

The report considers the main factors affecting the structure and properties of titanium alloys Ti6Al4V and CoCrMo alloys, obtained by additive methods. A comparative analysis of the structure and properties of Ti6Al4V or CoCrMo alloys obtained using various 3D printing techniques is presented.

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