ANALYSIS OF THE THERMAL PROCESSING INFLUENCE ON THE MICRO-STRUCTURE OF A METAL-CERAMIC 3D PART CREATED BY THE ADDITIVE TECHNILOGY METHOD

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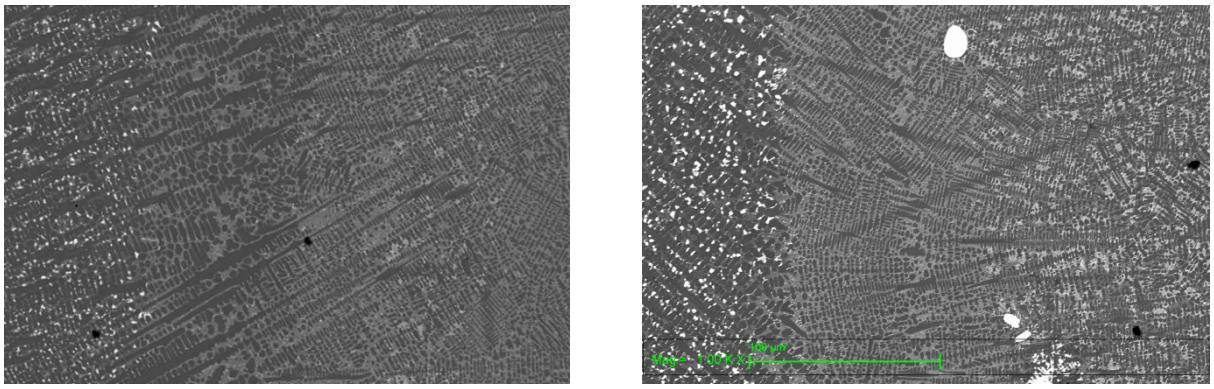
Today, thetimeofproductionofwear- andcorrosion-resistant coatings is a topical task. The coatings with high physical and mathematical characteristics are necessary in many areas of industry (high-strength cutting tools, elements of protection for parts acting in aggressive media, etc.). To solve these problems, metal-matrix composite coatings based on mixed metal powders and ceramics of different chemical content are used[1,2].

The paper deals with the influence of the thermal processing on the micro-structure of a 3D composition created by the additive technologies method. Amulti-layercoatingiscreatedbytheCO_2-laser; it consists of theWCand Ni powders mixture. The thickness of the grown composition is about 5 mm. Then the samples are put in a furnace for two hours, the temperature regimes 700°C, 800°C, and 900°C.The thermal processing regimeswere chosen on the base of [3].Analysis of the microstructure is carried out on an electronic scanning microscope Zeiss EVO MA 15. Thechangeinthecladmicro-structureafter the thermal processing is discovered(Fig. 1).The micro-hardness of the clad coating is measured.



a b

Figure 1. Photos made by the electronic scanning microscope
a) – the sample without post-processing, b) – the sample after 800°C thermal processing

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References

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