

## INVESTIGATION OF DIAMONDS PLASMA SPRAYED COATINGS

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**Abstract.** The paper presents both theoretical and technological concept of the formation coating containing selected diamond, nitrides and carbides. This type of powders were chemically covered with NiCo layer, surrounding the hard phases grains. The results obtained in this investigations were applied to a selection of optimal parameters of spraying, content of matrix metal in the coatings containing hard phase grains in accordance with its deposition rate, and wear resistance.

The paper presents some preliminary results of the project whose aim is to determine the technological conditions for the process of plasma spraying of hard phase grain containing coatings with some particular properties.

The program of the experimental research work had included preparation of powders, their morphological analysis, chemical nickel-cobalt coating, and investigation of plasma spraying parameters. The influence of spraying parameters variation on properties and microstructure of plasma sprayed coating was determined by means of deposition rate of powders. Scanning electron microscope investigation of the shape and size of the initial powders, revealed that the particles are of fairly irregular shape, and all HPG had covered by NiCo - coating. The datum on deposition rate of APS coating had the same dependences as UPS coating but the absolute value of this datum was higher, because the powder distribution in plasma stream was quite better, and area of the spot of spraying at the substrate quite higher. Coating density and their bond and cohesion strength depends on the degree of powder particles penetration in plasma stream, parameters of plasma, medium surrounding area, the speed of movement, temperatures, and materials of substrate.

From the experimental and theoretical part it is obvious that the HPG plasma coating can be used for machine tool if its content of HPG is considerable. The quality of this coatings can be estimated by its scalability and the efficiency of the process of plasma spraying, together with manufacturing aspects.