

THE FORMATION OF PLASMA SPRAYED COATING CONTAINING CARBIDES

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Abstract. The paper presents technological concept of the formation containing carbides (TiC, SiC). This type of powders were produced by self-propagated method of synthesis. Spraying parameters APS and CDS were determined. Microstructure and wear resistans of the obtained coatings were determined. The results obtained in this investigation were applied to a selection of optimal parameters of spraying, content of hard phase grains in acordance with deposition rate and wear resistance.

The program of the experimental research work had included preparation of powders, their morfological analysis, investigation of spraying parameters and studies on the microstructure and wear resistance of the coating obtained. The coatings were produced mainly using atmospherical plasma spraying (APS) and continuous detonation spraying (CDS).

Powder and coating morphology, porosity and homogeneity were investigated. Several tests for wear, corrosion behaviour, bond strenght and hardness were carried out. Protective coating was deposited by plasma spraying in air (APS) using Ar-H₂ mixture as plasma gases and CDS using propane (C₃H₈) and oxygen (O₂). The influence of spraying parameters variation on properties and microstructure of spraying coating was determined by means of deposition rate of powder.

Present investigation demonstrated, that carbide particle reinforced Al and AlSi coatings can be produced using atmospherical plasma spraying as well as continuons detonation spraying. The difference between both spray techniques becomes noticeable specially in the field of wear resistance. Here the CDS process showed the clearly better results. The coatings productions from composite powders containing carbides grains (SiC, TiC) is possible to use in wide field of industrial applications, where a combination of light structure materials combined with a high wear resistance is required.