

Application of PVD process to produce a composite with coating for the use in gloves protecting against hot factors

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Abstract: Surface modification of materials is one of the most popular materials engineering tools currently used. The wide selection of currently available types of coatings and their application technologies is the result of growing demand in recent years for innovative methods of modifying and protecting the surface of materials. Physical vapor deposition involves creating a coating on a substrate by physically depositing ions, atoms or molecules. There are three key types of physical vapor deposition due to the method of obtaining the deposited materials: classical evaporation, ion plating and sputtering [1]. Basalt fibers belong to the group of fibers with ultra-high thermal resistance, resistance to vibrations, dirt, good fatigue strength and resistance to UV radiation, corrosion and microorganisms, therefore basalt fabric is a suitable material for the production of palm part of protective gloves. Products made of basalt fibers are safe for humans, environmentally friendly and do not emit any chemical additives in the production process [2-4]. Due to the application of basalt fabric in the palm part of gloves protecting against hot work environments, the most important are their thermal properties, i.e., the resistance to contact heat, thermal radiation or convection heat [5]. For this reason, composites based on basalt fabric were produced in which composite coatings of various thicknesses containing aluminum and a mixture of zirconium dioxide and titanium dioxide were used by magnetron sputtering.

Keywords: PVD process, coating, composite, protective gloves, hot factors.

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