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**STATE OF THE SURFACE LAYER OF PRODUCTS FROM
NON-FERROUS METALS AND NON-METALLIC MATERIALS FORMED
DURING DIAMOND MICROTURNING AND POLISHING**

The aim of the work is to examine the state of the surface layer in precision micromachining, technical support of qualities and performance properties of surfaces of products from non-ferrous metals and non-metallic materials.

Processing of products from non-ferrous metals and non-metallic materials, such as semiconductor materials can be effectively carried out by using diamond microturning and polishing is conducted with articles made of sapphire. These technologies provide either work surfaces with extremely high accuracy or ensure the manufacturing of products with high performance in operation. They are associated with the use of special high-precision machine tools and special tools that are equipped with natural diamonds, or work at physical and chemical effects level. This tool wear is one of the reasons for the formation unacceptable stress state and non-treated surface requirements to product operation of a surface layer products.

This work dedicates to the original approach to monitoring and controlling of parameters of the surface layer in terms of microturning and polishing. The data on the mechanisms of the physical condition of the surface layer of products at microturning and polishing is obtained.

The research of contact interaction of cutting tools with details on the state of the surface layer products is conducted; techniques and hardware support for the control of the state of the surface layer in precision micromachining parts made of ferrous metal and non-metal materials are developed; computer modeling of the surface layer in precision micromachining products and comprehensive studies formation of a blanket of products under different conditions of processing is performed.

The method of tools diagnosis and state of the surface layer in the products in micromachining processes is developed.

The conducted researches enable to optimize technology of micromachining of products with a given optical purposes with a stable set of indicators.

Analysis of the results of research carried out in the direction of micromachining products from metals and non-metallic materials, shows that the goal of the theme set is fully implemented. According to the results of the research technological recommendations for improving precision machining technology finishing electronic products, optics and micromechanics are developed.