



Who we are

For a long time the main task of the department was to study the processes of cutting, as well as diagnostics of tool from polycrystalline superhard materials. Sensors and processing of acoustic emission signals are developed in the laboratory. Sensors are used in material science, metal cutting etc.. We also use acoustic techniques to study the damping properties of different materials.

Collaboration interests

Department of nondestructive testing and diagnostics of cutting tools from polycrystalline superhard materials and structured composites is interested in participating in EU projects under FP8 program and also in other forms of international projects in the following research areas: metal cutting, acoustic emission, and nondestructive testing. We are able to produce new wideband acoustic emission sensors, study material properties and products by nondestructive testing methods.

Potential role: joint research, scientific expert, technology provider.

Research Areas

- the development and manufacture of wideband acoustic emission sensors
- study the damping properties of materials by acoustic method
- measurement of the strength and fracture toughness of brittle materials under dynamic loads
- ultrasonic inspection of hard alloys products
- study of wear and fracture of cutting tools in metal cutting

Main achievements

The principally new in design wideband acoustic emission sensors with a frequency range from 200 kHz to 1200 kHz has been developed. The new method of damping the rear side of piezoceramic plates has been used. The original charge amplifier for accommodation of sensors and electronic equipment with different current inputs, implements of optimal scheme including sensor and preamp with a minimum ratio of "signal - noise" has been designed.

An apparatus for the measurement of damping properties of materials has been developed.

A "Koper", the equipment for dynamic testing, to determine the strength characteristics of brittle materials has been developed.

Reference projects

The Project "RESURS" "Development of a method of diagnosis and prediction of performance of hard alloys products for heavy duty» (№ state registration 0107U004911)

III-72-07 - "Research on the formation of the surface layer of products of nonferrous metals, semiconductors and non-metallic materials with precision diamond microprocessing» (№ state registration 0107U002814)

Contact information

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Well-qualified researchers: 1 Dr. Sci., 1 Ph.D., 1 M.Sc.
 Well-qualified workforces to operate with acoustic and metalworking equipment, analytical and technological facilities.
 Wide experience on metal cutting, acoustic emission and nondestructive testing research areas.
 We have experience of co-operation with partners from USA and Russia.

What makes us a good partner