

FSBI TISNCM

Synthesis of diamond single crystals weighing up to 7 carats that do not have natural analogs.

Development of hard alloys based on TiC-ZrC; ultrahard fullerites; UO_2 ceramics, $\beta\text{-Si}_3\text{N}_4$, new Bi_2Te_3 -based nanostructured thermoelectric materials.

X-ray Optics and Diamond Anvils

Research under ultrahigh pressures up to 2.5 - 3 Mbar. Absence of luminescence.

X-ray optics unparalleled anywhere in the world as confirmed by independent research in the Argonne National Laboratory.

Diamond Single Crystal Microsurgical Scalpels

Hardness exceeds 105 GPa.

Grinding radius is less than 4 nanometers.

Thanks to their superiority in all parameters over steel scalpels diamond single crystal scalpels reduce the surgery risks to a minimum and provide healing at a far quicker rate.

Power Supply and Sensors based on Diamond Single Crystals

1040 single structures on a single crystal.

Integral forward current higher than 1A (5mA/mm).

Ultraviolet and temperature sensors, and sensors of ionizing radiation.

The highest measurement accuracy, wide range and high speed.

Extreme Acoustoelectronics

High and ultra high pressure sensors.

Remote temperature control under radiation effects.

Conversion of the nuclear radiation energy to electric energy.

Instrument Making

Unparalleled "NanoScan" scanning nanohardness testers.

Devices and apparatus for identification and sorting of diamonds, created jointly with "ALROSA" and superior over all the world analogues.



Production of Installations

Development and creation of high-pressure equipment and control systems for technological processes of synthesis.

A smoothly running for several years method and installations of HPHT.

High-end equipment for CVD synthesis of diamond layers.



Products for Drilling Equipment

Two-layer diamond-hard alloy plates.

Successfully passed a field test at "Gazprom Neft".

Covering 25 - 30% of RF needs in PDC for drill bits on the first stage of deployment production and 80 - 90% on the second stage.

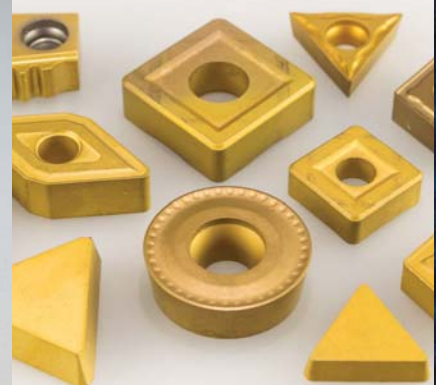


Carbide Tools and Waterjet Cutting Nozzles

Carbide (WC - Co) tools with coating of TiC, TiCN, Al_2O_3 , TiB_2 , etc.

High-precision processing of materials.

Single-crystal diamond nozzles - wear resistance up to 10 000 hours at 6 000 atmospheres.



Diamond Micromechanics

Manufacture of micromechanics from diamond single crystals.

Diamond properties allow obtaining levels of accuracy and durability unattainable for mechanics made of any other metal or alloy.



