influence on raw materials by means of mechanisms of controlling actions. In this case the process of the incoming raw materials, raw materials changing mechanism, controlling action and output in the form of products or service can be regarded as a model of hazard formation.

In this case the process of the life cycle at the provision of service as well as other processes is regulated by entrance into process management, i.e. controlling action. Consequently entrance into the process management plays the most important role in attaining quality to products or service and at the same time the loss of quality products or service which means hazard formation. All components of the process, personnel actions, mechanisms work, parameters of incoming raw materials and outcoming products or service are under the influence regulatory documents.

Thus competently elaborated regulatory acts allow avoiding accidental situations in the main pipeline transport. Taking into account the priority of regulatory acts in providing safety, accidental situations which occur in the main pipeline transport indicate the need to improve the existing technical regulatory legal acts. Accidents may occur due to poor elaboration of requirements for processes, lack of some requirements for processes or lack of the whole technical regulatory legal act for the process.

To reveal the lack of technical regulatory legal act for a number of processes in the main pipeline transport is possible be means of compiling a total database of technical regulatory legal acts and their systematization according to legal status, life cycle processes, the type of transported product, object localization.

At present there is no documented system of views with priorities of standardization and ways of improvement of present fund of technical regulatory legal acts in the main pipeline transport. The creation of this documented system would allow increasing safety of processes in the main pipeline transport.

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UDC 621.9.04

STIFFNESS OF BLOCK-MODULAR CUTTING TOOLS

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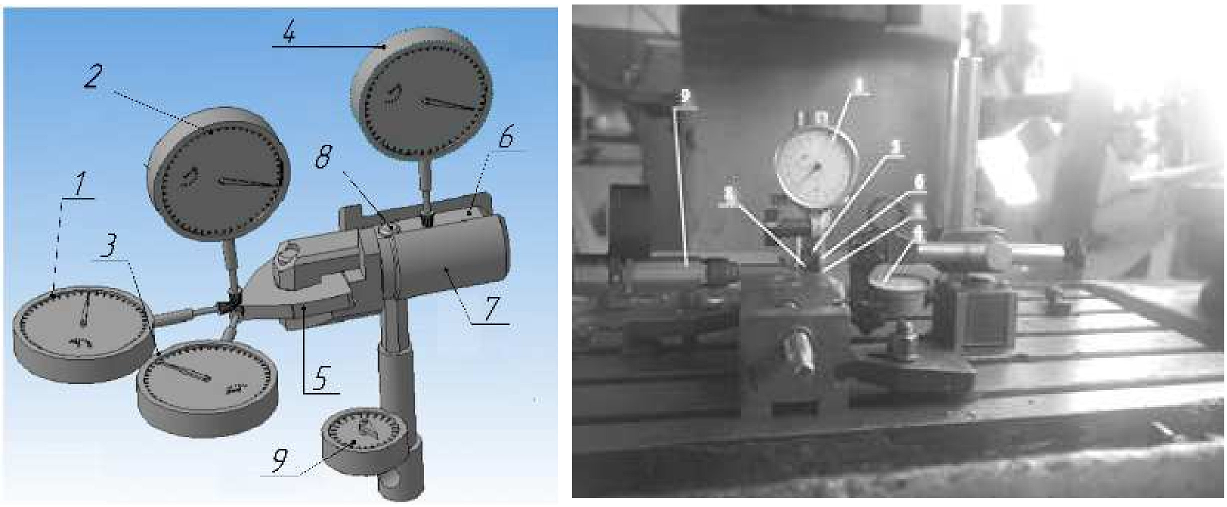
The results of experimental studies of clamping mechanisms stiffness are presented, recommendations to improve clamping system are given.

Reliability of prefabricated cutting tools is determined to a large extent by the reliability of fixing plates in the housing. There are several structures of clamping mechanisms according to the working conditions of cutting tools and peculiarities of their manufacture [1, 2]. The existing systems of cutting plates fixing are shown most thoroughly in [3, 4, 5]. These systems reflect the current trends in the designing of cutting tools: high precision of cutting plates manufacturing, closed grooves precisely manufactured to place cutting plates, cutting plates clamping mechanisms with a minimum number of structural elements, such as a screw or a lever. Implementation of such systems in terms of domestic tool production is not always possible, as it requires special equipment and precise high-quality components. Therefore, it is urgent to establish a system of cutting plates fixing that is efficient for domestic production conditions and is not inferior in reliability to the best foreign systems.

During the experimental verification of the obtained calculation data the displacement values of cutting plate and those of a strap were fixed at different points for different clamping forces of the screw (figure 1). In particular, the displacement values of the cutting plate (pos.5) in the tangential, radial and axial directions were measured by indicators (pos. 1, 2, 3). The displacement values of the strap (pos. 6) were measured by indicator (pos. 4). The clamping force of the screw (pos. 8) was created by a torque wrench (pos. 9).



a *b*

Fig. 1. 3D-model (*a*) and the experimental unit (*b*) for measuring displacement of a cutting plate and a strap: 1, 2, 3, 4 – dial test indicator; 5 – cutting plate; 6 – strap; 7 – cutting block; 8 – clamping screw; 9 – torque wrench

The results of displacement measurements of a cutting plate and a strap in the cutting block are presented as graphs in figure 2.

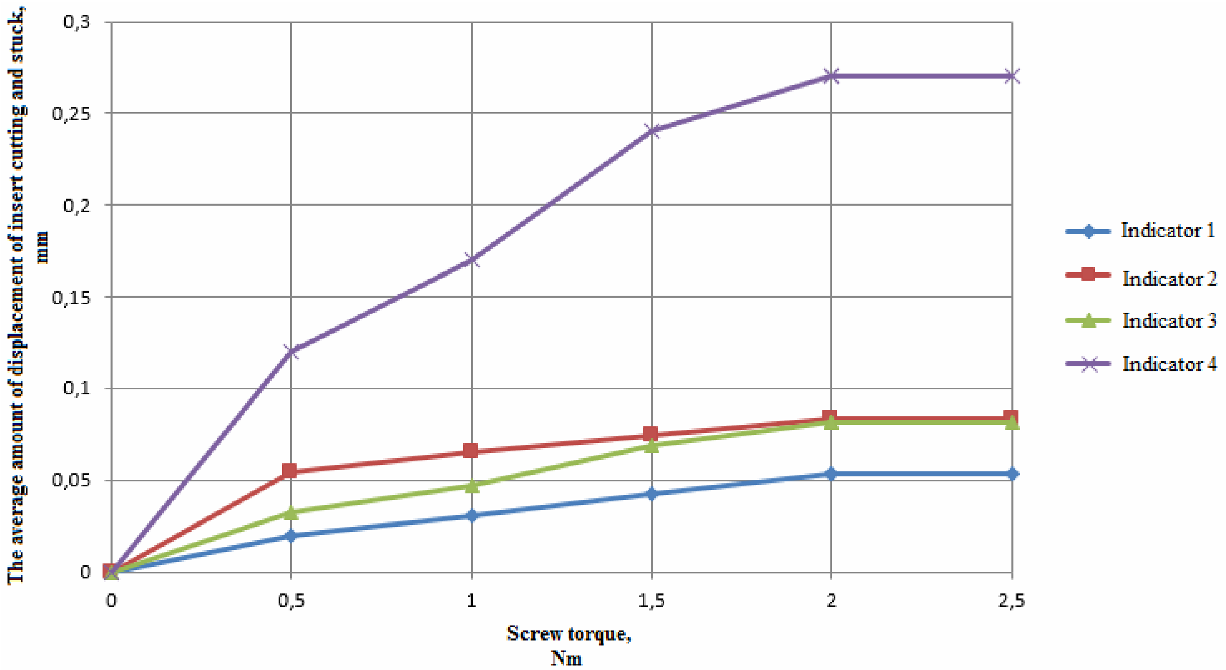


Fig. 2. The dependence of displacement values of the cutting plate and the strap in the cutting block on the torque wrench load

As shown in the graphs, the cutting plate displacement values are minor and minimal in the radial direction. At a load of about 2 Nm displacement is not observed, which indicates sampling of gaps between the plate, the sides of the groove and the screw. The strap has greater displacement than the cutting plate, which requires changings in the structure of the former. Calculations of cutting block structure stiffness were made according to the obtained displacement values and efforts applied to the screw. The calculations were made as the ratio of the clamp value to the displacement value of the unit. The results of experiments and calculations are presented in figure 3.

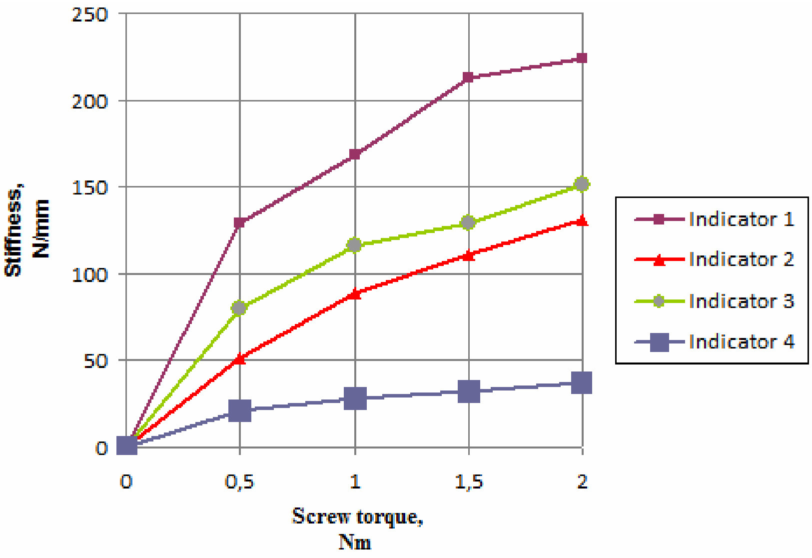
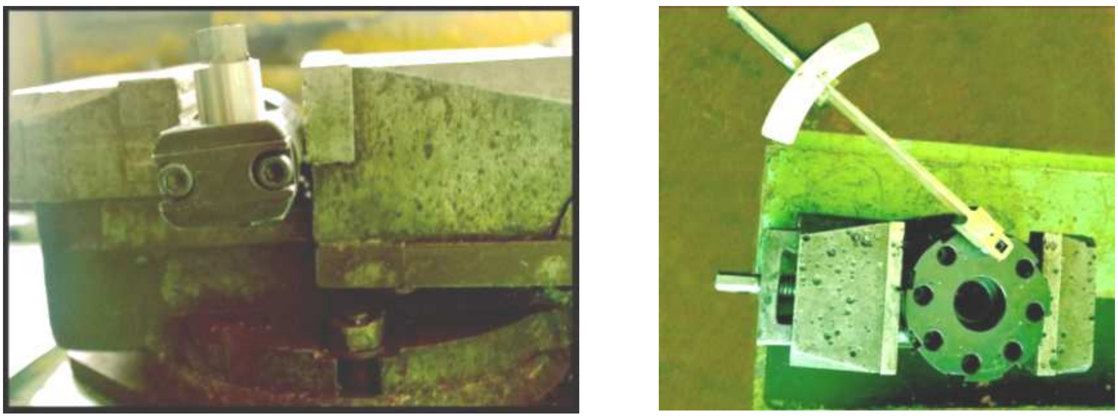


Fig. 3. The dependence of cutting block structure stiffness
on the screw torque 1, 2 and 3 – cutting plate in the radial, tangential and axial directions, 4 – strap

As shown in the graphs, at a certain screw torque (within 1 – 2 Nm) the cutting plate has maximum stiffness of fixing and the strap has minimum stiffness of fixing.

Reliability of the cutting block fixing in the housing module were experimentally tested with stuck-screw clamps (figure 4, *a*) and single and double wedge-screw (figure 4, *b*) mechanisms. A certain torque was applied to the cutting block, which simulated the torque of cutting force. The applied torque caused turning of the cutting block. The tightening torque and the value of the applied torque were consistently fixed during the experiment.



a *b*

Fig. 4. Experimental units for studying of the clamping mechanisms:
a – stuck-screw; *b* – single and double wedge-screw

Figure 5 shows the results of the experiment.

As shown in the graphs, turning torque of the cutting block in the clamping mechanism increases according to the value increase of screw torque of clamping mechanism, and at maximum torque value the cutting block displacement in clamping mechanism does not occur. Moreover, a reliable fixing in double wedge-screw mechanism of cutting block occurs when the tightening torque is 5 Nm, while in the single wedge-screw and stuck-screw it is only at 12,5 Nm and 15 Nm respectively.

Thus, experimental results confirm the efficiency of block-modular cutting tool structures.

1. The presented clamping mechanism ensures reliable fixing of the cutting plate with minimum values of screw torque.
2. Double-wedge screw mechanism for cutting block clamping is the best one out of the studied mechanisms as it provides 2 – 3 times greater torque.

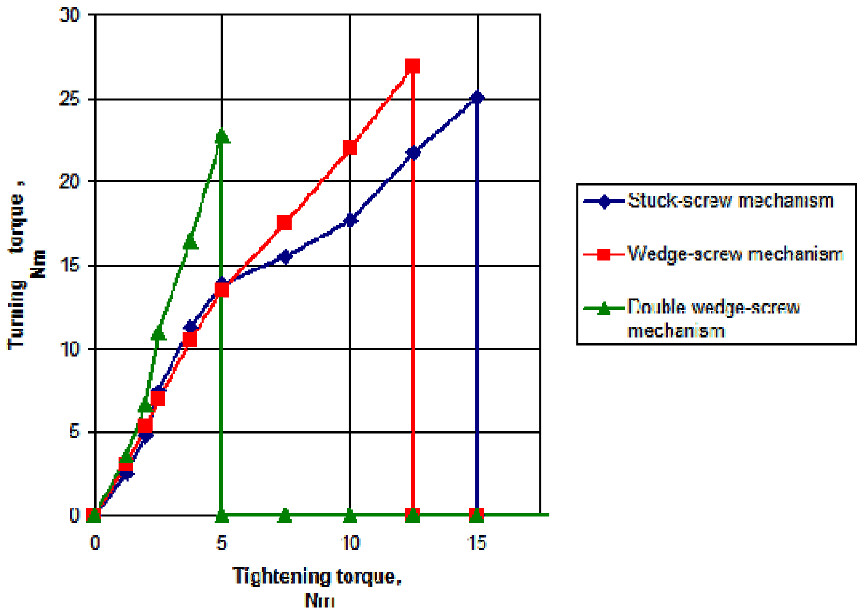


Fig. 5. The dependence of turning torque of the cutting block on tightening torque

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UDC 528.21

EVALUATION OF THE ACCURACY OF THE GLOBAL GRAVITY MODEL EIGEN-6C2 IN COMPARISON WITH THE MODEL EGM2008 IN RELATION TO POLOTSK GEODYNAMIC PROFILE

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Polotsk geodynamic profile was created in 2004 on the basis of geological, geophysical and seismological studies [1, 2, 3], carried out in Polotsk-Kurzeme zone of tectonic faults. This belt isolated relatively recently in the body of the East European Platform group of geologists and geophysicists of the Institute of Geochemistry and Geophysics of Belarus on the basis of gravity, magnetic anomalies and seismological data [1].

Polotsk geodynamic profile includes 12 leveling benchmarks, the centers of which are laid at a depth of 3.0 meters (Fig. 1). Eleven leveling benchmarks were laid in 2004. № 59 leveling benchmark included in the previously established network of state high-precision leveling.

As you know, the height anomaly is one of the characteristics of the anomalous gravity field distribution on the earth surface which can judge the degree of homogeneity or heterogeneity of the local gravitational field of the Earth in the study area. Assuming that the inhomogeneity of the gravitational field in the target geodynamic profile caused by the presence of inhomogeneities in the earth's crust, it is expected that changes in height anomalies in the profile will be observed, first of all, on the faults.