



National Technical University «KhPI»

Technology of Machine Building and Metal-Cutting Machine Tools

PROPOSALS FOR COOPERATION OF DEPARTMENT OF MACHINE BUILDING TECHNOLOGY AND METAL CUTTING MACHINES OF NTU “KhPI”



National Technical University «KhPI»

Technology of Machine Building and Metal-Cutting Machine Tools

**DEPARTMENT OF MACHINE BUILDING TECHNOLOGY
AND METAL CUTTING MACHINES**



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National Technical University «KhPI»

Technology of Machine Building and Metal-Cutting Machine Tools

Training of students for directions:

Applied Mechanics:

- *Automated production technology*
- *Metallcutting machines and systems*

Qualification

Bachelor of Applied Mechanics and Master of Applied Mechanics

Automation and Computer Integrated Technologies:

- *Automated control of technological systems in engineering*
- *Automated control of technological preproduction in engineering*

Qualification

*Bachelor of Automation and computer-integrated technologies and
Master of Automated management of technological processes*

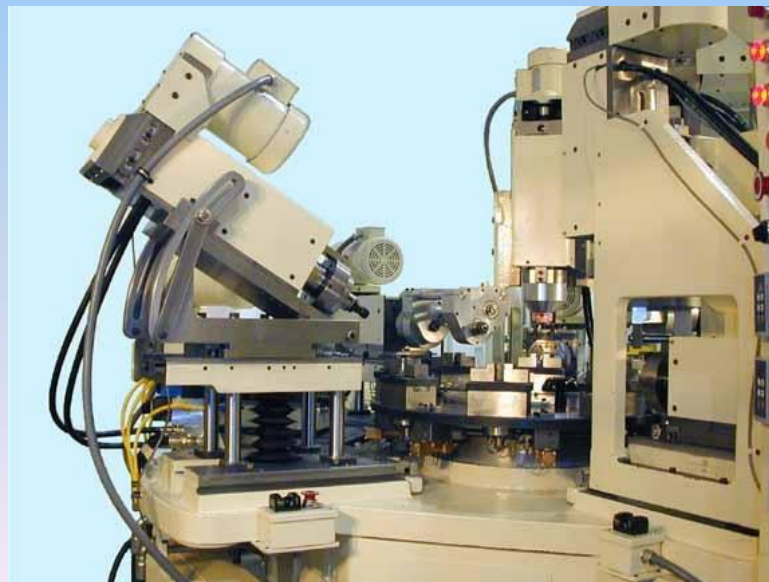
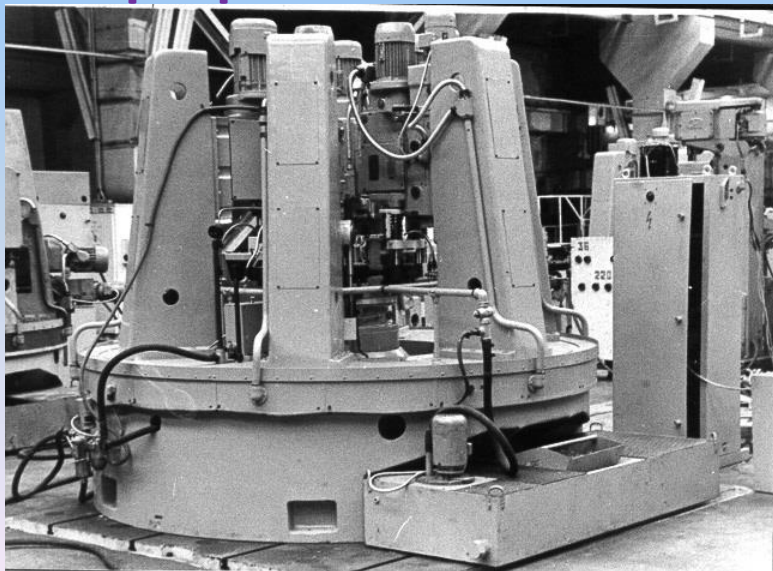


National Technical University «KhPI»

Technology of Machine Building and Metal-Cutting Machine Tools

THE MOST SIGNIFICANT RESULTS OF THE DEPARTMENT IN THE SCIENTIFIC ACTIVITY

1. Technological bases of designing and komponentika of unit-buildings machine tools - the design of unit-buildings machine tools of optimal grouping; techniques of unit-buildings machine tools from unified units for different purposes





Basic publications:

1. Permyakov A.A. Analysis of grouping of modular-type machines with a rotary-dividing barrel / A.A. Permyakov, Y.V. Timofeev, I.E. Yakovenko // Journal of Nat. tehn. Univ. "KhPI": Collection of scientific papers. Special Issue: Engineering Technologies. Kharkov: NTU "KhPI". – 2015. – N 40(1149). – P. 96–101. (in rus.)
2. Permyakov A.A. Modern power units as the element base of creating machine tools and aggregate-modular design systems / A.A. Permyakov // High technologies in mechanical engineering: Collection of scientific papers. – Kharkov: NTU "KhPI". – 2015. – 1 (25). – P. 123–133. (in rus.)
3. Yakovenko I.E. Optimization of cutting conditions when using processing tool blocks / I.E. Yakovenko, A.A. Permyakov // Journal of Nat. tehn. Univ. "KhPI": Collection of scientific papers. Special Issue: Engineering Technologies. Kharkov: NTU "KhPI". – 2015. – N 4(1113). – P. 89–92. (in rus.)
4. Petri networks for a modeling of grouping the difficult-structural aggregating process equipment / A.A. Permyakov [et al.] // Journal of Nat. tehn. Univ. "KhPI": Collection of scientific papers. Special Issue: Engineering Technologies. Kharkov: NTU "KhPI". – 2015. – N40 (1149). – P. 96–101. (in rus.)



2. Technological support, modeling and optimization machining of polymeric composite materials - the modeling of forming the products from polymer-matrix composite, which is based on control of process directed destruction of removable work-in-process stock.

Basic publications:

1. Khavin G.L. Drilling of polymer-matrix composites. – Monograph, 2017. – 372 p. (in rus.)
2. Machining of fibrous polymeric composites / Verezub N.V., Tarasiuk A.P., Khavin G.L. – Kharkov: Print KhNARI (KhARI), 2001.– 180 p. (in rus.)
3. Khavin G.L. The appearance of defects during drilling layered composites and the mechanism of delamination appearance // Journal of Nat. Tehn. Univ. "KhPI": Collection of scientific papers. Special Issue: Engineering Technologies. Kharkov: NTU "KhPI". – 2015. – N 4(1113). – P. 96–100. (in rus.)



This scientific direction has received state financial support in the framework of research work of Ministry of Education and Science of Ukraine:

"The development of the theory of machining composite materials based on the achievements of fracture mechanics" (**DR № 0103U001498**);

"Creation of a generalized theory of machining composite materials and tool wear" (**DR № 0106U001475**); "Development theory and creation of a generalized model of machining composite materials, setting tool and cutting conditions" (**DR №: 0109U002384**); "Creation of theoretical bases and methods of solving problems to ensure the strength and reliability of heavy loaded elements engineering structures" (**DR № 0112U000403**); "

Creation of mathematical models and methods for solving nonlinear problems of dynamics and durability of structural elements under the action of quasi-static, dynamic and shock loads" (**DR № 0115U000509**).



3. Increased efficiency of finishing treatment - the scientific foundations of grinding technology with adaptive control and the scientific foundations of friction processing and using coolant for grinding process.

Basic publications:

1. Siziya U.A. The dynamic and thermo physic of grinding / U.A. Siziya, D.V. Stalinskyy. – Kharkov: SC UkrSTC «Energostal». – 2016. – 448 p. (in rus.)
2. Siziya U.A. Thermo physics numerous of cutting abrasive grains of the grinding disk / U.A. Siziya, D.V. Stalinskyy, A.N. Ushakov // Journal of NTU "KhPI". – 2009. – N41. – P. 46–70. (in rus.)
3. Siziya U.A. Temperature of self-heating during grinding / U.A. Siziya, D.V. Stalinskyy, A.N. Ushakov // Eastern European advanced technology magazine. – 2009. – 1/5, N37. – P. 24–38. (in rus.)



4. Optimization of technical-organizing and technological groupings systems of mechanoerecting production which based on simulation - the use of simulation methods in the actual production with a purpose to improvement of production in all aspects of the process: design – production – control.

Basic publications:

1. Shelkovoy A., Klochko A., Naboka E. Simulation modelling in tasks of mechanoerecting production.—Saarbrücken, Germany: LAP LAMBERT Academic Publishing, 2015.— 528 c. (in rus.)
2. Technological features processing of long-pitch hardened gears / N.V. Kravzov, U.V. Timofeev, A.A. Klochko and others. Editor by A.A. Permyakov // VolSTU – Togliatti: CJ-SC «ONIKS», 2012. – 254 p. (in rus.)



5. Mathematical modeling of fast physical processes by shock, laser and aerodynamic actions - mathematical models and studied the processes of high-speed milling of hardened steel details, including details of a variable stiffness.

Basic publications:

1. Dobrotvorskyy S.S. Computer design and modelling processes high-speed milling hardened steels / S.S. Dobrotvorskyy, E.V. Basova, L.G. Dobrovolskaya // Journal of NTU "Lviv Polytechnic". Series: Optimization of process production and technical control in mechanical engineering and instrument-making industry: collection of scientific papers. – 2015. – N822. – P. 7–13 (in ukr.)
2. Dobrotvorskyy S.S. The geometrical parameters of shear plane when making high-speed machining of involute surface by end-milling cutter with rounded end / S.S. Dobrotvorskyy, E.V. Basova // Proc. NiznSTU in memory of P.E. Alekseeva. – 2011. – N 2(87). – P. 95–100. (in rus.)
3. Dobrotvorskyy S.S. Research degree of multilayer packages deformation under impact loading hemispherical striker with CAE systems [Text] / S.S. Dobrotvorskyy, S.S. Gnuchih, L.G. Dobrovolskaya // Public information and computer integrated technologies: col. of scien. papers. – Kharkov: Nat. aerospace univ. «Kharkov aviation institute», 2015. – V.69. – P. 201–206. (in rus.)
4. Dobrotvorskyy S.S. Modeling of plates shock deformation by hemispherical striker / S.S. Dobrotvorskyy, S.S. Gnuchih, L.G. Dobrovolskaya // Journal of Nat. Tehn. Univ. "KhPI". Series: Engineering Technologies. Kharkov: NTU "KhPI". – 2015. – N 40(1149). – P. 39–42. (in rus.)



6. Design, optimization and simulation of heating points for district heating and cooling systems, the assessment of energy efficiency of industrial plants, validate and implement energy saving measures in industry and municipal engineering

Basic publications:

1. Plate heat exchangers in heat supply / Tovazhnianskyy L.L., Kapustenko P.A., Khavin G.L., Arsenieva O.P. Editor by G.L. Khavin // Monograph. – Kharkov: NTU "KhPI". – 2007. – 448 p. (in rus.)
2. Shell-and-Plate Heat Exchangers for Efficient Heat Recovery under the Industrial Application / O. Arsenyeva, L. Tovazhnyanskyy, P. Kapustenko, G. Khavin // Chemical Engineering Transactions. – 2015. – 45. – P. 1231–1236.
3. Possibility of Heat Pump use in Hot Water Supply Systems / T. Babak, N. Duić, G. Khavin, S. Boldyryev, G. Krajačić // Journal of Sustainable Development of Energy, Water and Environment Systems. – 2016. – Vol. 4, N 3. – P. 203–215.



7. Technological support productivity, accuracy and quality parameters of the surface layer of coarse-grained hardened cogwheels - research and development of technological methods of forming the surface layer of coarse-pitch hardened cylindrical gears

Basic publications:

1. Shelkovoy A.N. Technological conditions for forming of the surface layer parameters of cogwheels and their influence on the performance properties / A.N. Shelkovoy, A.A. Klochko, O.A. Ancziferova, S.U. Palashek // Physical and computer technology. Proc. of the 21-th International Scientific and Practical Conference, 24–25 December 2015. – Kharkov. – D.: «Lira», 2015. – P. 107–120. (in rus.)
2. Technological features of processing coarse-grained hardened cogwheels / N.V. Kravtcov, U.V. Timofeev, A.A. Klochko and other. Editor by A.A. Permyakov // VolSTU – Togliatti: CJ-SC «ONIKS», 2012. – 254 p. (in rus.)
3. Investigation of the influence of waviness parameters on the performance properties of coarse-grained cylindrical cogwheels / E.V. Mironenko, A.A. Klochko, A.N. Shelkovoy, A.A. Iaroshenko, S.U. Palashek // The reliability of the tool and optimization of technological systems. Coll. sci. papers. – Kramatorsk: SGMA. – 2014. – V. 34. – P. 19–25. (in rus.)



8. The world's first the gearwheels with the effect of non-Newtonian state working fluid and aliquant the gearwheels, hardening teeth by spray instead of high frequency current, working oil with the effect of selective transfer

Basic publications:

1. Shelkovoy A.N. The world's first is gearwheels with the effect of non-Newtonian state working fluid / A.N. Shelkovoy, A.A. Klochko, E.V. Basova // Journal of Nat. Tehn. Univ. "KhPI". Series: Engineering Technologies. Kharkov: NTU "KhPI". – 2016. – N 5 (1177). – P. 104–109. (in rus.)
2. Litvinov V.M. Technological features of hardening of large gears by spray method in heavy engineering / V.M. Litvinov, E.V. Mironenko, A.N. Shelkovoy, M.I. Gasanov, A.A. Klochko // The reliability of the tool and optimization of technological systems. Coll. sci. papers. – Kramatorsk: SGMA. – 2016. – V. 38. – P. 51–59. (in rus.)
3. New in the development and manufacture of high hydrodynamic cylindrical gear wheels with non-Newtonian fluids capable of lubricating / B.D. Kovaliov, E.V. Mironenko, A.N. Shelkovoy, A.A. Permyakov, A.A. Klochko, D.O. Kravchenko // Heavy engineering. Problems and Prospects. Proc. of 13th inter. Conf., 2–4 June 2015 / by Editor B.D. Kovaliov. – Kramatorsk: SGMA, 2016. – P. 47–48. (in rus.)