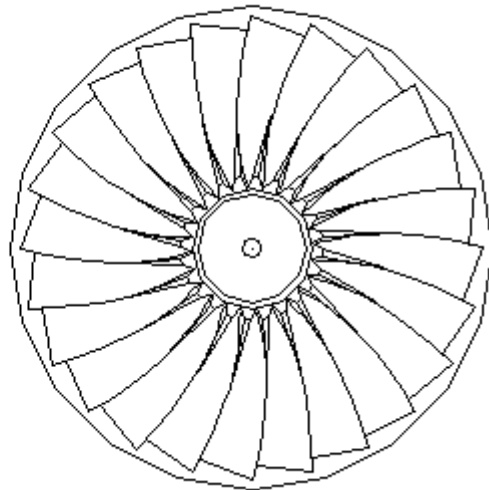
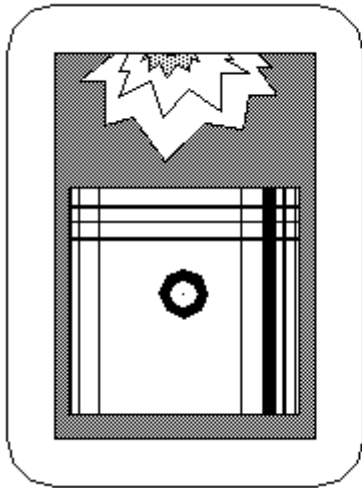


**National Aerospace University «KhAI»
National Technical University «KhPI»
State Enterprise «Ivchenko-Progress»
Joint Stock Company «Motor Sich»
Joint Stock Company «FED»**



XXIX

**INTERNATIONAL CONGRESS
OF PROPULSION ENGINEERING**

September 3-6, 2024

Invite letter and program

Kharkiv – Ukraine

WELCOME!

The Organizing Committee would like to cordially invite you to attend the XXIX International Congress of Propulsion Engineering.

The Congress focuses scientific-technical communications, the determination of perspective ways to create and develop new equipment and technologies, finding new opportunities for designing the engines of non-standard schemes and sizes, making business and finding new commercial contacts.

The work will be organized in a distant form of video-audioconference, using Zoom platform.

ORGANIZING COMMITTEE:

- National Aerospace University «KhAI»;
- National Technical University «KhPI»;
- State Enterprise «Ivchenko-Progress»;
- Public Stock Company «Motor Sich»;
- Public Joint Stock Company «FED».

Languages of the Congress: Ukrainian, English.

Contact persons in Kharkiv, Ukraine:

ALEXANDER BILOHUB
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Regulations:

Report to the plenary session 25 min.
Report to the session 12 min.
Discussion 5 min.

Available technical facilities:

- Computer with Internet-link;
- Webcam with (or) microphone;
- Zoom software (is recommended to be installed beforehand);
- Power Point editor is recommended for presentations.

Registration of the Congress participants:

To approve participation in the congress, you need to fill the form following the link <https://forms.gle/broaCe6jtB1h5YA5A>.

A link to the conference and more detailed information about the registration and the congress format can be found on our official website

<https://propulsioncongress.com>

as well as on the website of KhAI

<https://khai.edu.ua/nauka/konferentsiyi/naukovi-konferencii-hai/mizhnarodnij-kongres-dvigunobudivnikiv4/>

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A. P. Marchenko	Vice-Rector of the National Technical University “KhPI” D.Sc., Prof.
S. V. Yepifanov	Head of Department of National Aerospace University “KhAI”, D.Sc., Prof.
V. V. Popov	Chairman of the Board of PJSC “FED”, Ph.D.
L. P. Klimenko	Rector of Petro Mohyla Black Sea State University, D.Sc., professor

ACADEMIC SECRETARY:

A. V. Bilohub	N. E. Zhukovsky National aerospace university “KhAI”, D.Sc., Prof.
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PROGRAM OF CONGRESS

September 3 10⁰⁰ – 13⁰⁰

PLENARY SESSION

Session Chair: **S. V. Yepifanov,** Dr. Eng. (KhAI, Kharkiv);
I. F. Kravchenko, NASU (SE «Ivchenko-Progress»,
Cor. Zaporizhzhya);
Memb.
A. P. Marchenko, Dr. Eng. (KhPI, Kharkiv).
Секретар: **A. V. Bilohub,** Dr. Eng. (KhAI, Kharkiv).

1. I. F. KRAVCHENKO (Zaporizhzhya).
**"The art of conquering the sky".
To the 110th anniversary of the birthday of V. O. Lotarev,
Academician of the National Academy of Sciences, General
Designer**
2. A. P. MARCHENKO, I. V. PARSADANOV (Kharkiv).
**Criteria for evaluating the efficiency of transport power plants
decarbonization**
3. Ye. V. BILOUSOV (Kherson).
**The history of the introduction of the cycle with mixed heat
input: a new look at the known facts**

Evening Meeting of Section
THEORY AND OPERATION PROCESSES

September 3 14⁰⁰ – 17⁰⁰

Chairmen: **G. O. Gorbenko** Dr. Eng. (KhAI, Kharkiv);
 Yu. M. Tereschenko, Dr. Eng. (NAU, Kyiv);
 M. R. Tkach, Dr. Eng. (NSU, Mykolayiv);
Secretary: **O. V. Bondarenko,** (KhAI, Kharkiv).

1. I. I. YUDIN (Kyiv)
 Analysis of temperature distribution in the mixing chamber of a two-circuit turboreactor engine with a turbofan attachment
2. A. A. DULIEPOV (Kyiv)
 Numerical simulation of flow in the fan stage of a turbofan engine
3. A. A. DULIEPOV, A. V. BALALAEV (Kyiv)
 Fan parameters estimation of a turbofan engine with annular grooves casing treatment
4. Yu. M. TERESHCHENKO, Yu. Yu. TERESHCHENKO,
 V. V. RATYNSKYI, O. I. CHUMAK (Kyiv)
 External resistance of a gas turbine engine nacelle with boundary layer extraction
5. V. V. OTROSHCHENKO, M. O. PIKUL,
 Yu. M. TERESHCHENKO (Kyiv)
 The influence of blade row temperature on the efficiency and pressure ratio of an axial compressor impeller
6. V. Yu. USENKO, K. V. BALALAEVA,
 M. M. MITRAKHOVYCH (Zaporizhzhya, Kyiv)
 Assessment of the effective thrust of a ducted coaxial propfan in flight conditions
7. A. A. KOVTUN (Kyiv)
 Determination of the influence of the shape and number of blades on the efficiency of the quadcopter propeller

8. A. A. KOVTUN (Kyiv)
Determining the sound pressure level of the UAV propeller
9. A. A. KOVTUN, A. O. MELCHENKO, K. V. BALALAEVA,
V. Yu. USENKO (Kyiv)
Assessment of the acoustic radiation of a UAV ducted propeller
10. A. O. KHOROKHORDIN, M. M. MITRAKHOVYCH (Zaporizhzhya)
Results of the research of quasiisoeutropic air compression in a flat supersonic inlet device power plant with GTE
11. D. PLAKUSHCHYI, I. KRAVCHENKO (Zaporizhzhya)
Results of research characteristics of a covered rotary propeller fan in flight conditions

September 6

Morning Meeting of Section

THEORY AND OPERATION PROCESSES

September 4 9⁰⁰ – 13⁰⁰

Chairmen: **M. M. Mitrakhovych**, Dr. Eng. (SE «Ivchenko-Progress», Zaporizhzhya);
D. A. Dolmatov, Dr. Eng. (KhAI, Kharkiv).
Secretary: **T. P. Mikhaylenko** PhD (KhAI, Kharkiv).

1. S. G. VOYTENKO, O. M. DOBRIDENKO, Yu. M. TERESHCHENKO, I. L. TROFIMOV, A. V. YAKOVLIEVA (Kyiv)
Ensuring the chemical and mechanical reliability of aircraft engines when using imported fuels
2. V. V. STOLIARCHUK (Dnipro)
Validation of methods for increasing the efficiency of detonation jet engines
3. O. D. NIKOLAYEV, I. D. BASHLII, R. MARCHAN (Dnipro)
Vortex formation and low-frequency oscillations of gaseous combustion products in the combustion chamber at liquid-propellant rocket engine operating

4. V. V. NERUBASKYI (Odesa)
Current state and the future of the gas turbine engines for super-heavy helicopters
5. O. Yu. LYSYTSIA, I. I. PETUKHOV (Kharkiv)
CFD-modeling of flow distribution when mixing hydrogen and air in a channel
6. R. TSUKANOV, S. YEPIFANOV (Kharkiv)
Systems for cooling liquid injection in turbine engine gas flow duct
7. D. DOLMATOV (Kharkiv)
The role of negative oxygen ions in reducing the intensity of NO_x formation and reducing the speed of flame propagation
8. D. DOLMATOV (Kharkiv)
Numerical and physical studies of high-temperature combustion and electrical stimulation of the primary combustion zone
9. D. DOLMATOV (Kharkiv)
Features of sensitivity analysis of reaction mechanisms for processes with anomalous distribution of excited particles and non-Arrhenius reactions
10. SAI VIGNESS RAMASAMY, L. BAZYMA (Kharkiv)
Iodine as an alternative propellant for space electric propulsion
11. S. NESTERENKO, PENG SHUAI (Kharkiv)
Modelling of the processes inside the nozzle of resistojet and arcjet with molecular propellant
12. MAURÍCIO SÁ GONTIJO (Brasil)
Investigation of the existing methods for designing pre-combustion chambers in hybrid rocket engines

Evening Meeting of Section

PISTON INTERNAL COMBUSTION ENGINES

September 4 14⁰⁰ – 17⁰⁰

Chairmen: **A. P. Marchenko,** Dr. Eng. (KhPI, Kharkiv);
 I. V. Parsadanov, Dr. Eng. (KhPI, Kharkiv);
 R. A. Varbanets, Dr. Eng. (OSMU, Odesa)
Secretary: **A. V. Bilohub,** Dr. Eng. (KhAI, Kharkiv).

1. O. V. GRYTSYUK, A. P. KUZMENKO, B. O. LAZCHENKO,
 V. V. KOPYLOV (Kharkiv)
 **Scientific-technical and production potential of Ukraine for the
 production of scientific products of diesel construction**
2. Yu. F. GUTAREVICH, M. D. MOUNTAIN (Kyiv)
 **Improving performance of a spark-ignition engine in full load
 modes by adding nitrous oxide to the air charge**
3. Ye. V. BILOUSOV, A. P. MARCHENKO, V. P. SAVCHUK,
 T. P. BELOUSOVA (Kharkiv, Kherson)
 **Use of methanol as motor fuel for marine internal combustion
 engines**
4. A. P. MARCHENKO, M. T. MISHCHENKO (Kharkiv)
 **Research of the combustion parameters of gasoline with
 additional hydrogen in a spark-ignition engine in external
 speed characteristic modes**
5. O. M. KONDRATENKO, K. R. UMERENKOVA,
 A. M. LIEVTIEROV, O. P. STROKOV, V. Yu. KOLOSKOV,
 O. O. LYTVYNENKO (Kharkiv)
 **Provision of ecological and fire safety in exploitation of vehicles
 based on piston pneumatic and cryo engines using nitrogen as
 working fluid**

6. A. M. LEVTEROV, A. M. AVRAMENKO (Kharkiv)
Selection of gas mixer parameters for diesel conversion generator motor in gas diesel
7. D. I. IVANOV, S. Y. BILYK (Kharkiv)
Advantages and features of using digital twin technology for stationary gas engines
8. A. KRAVCHENKO, B. CHUCHUMENKO, D. TALANIN (Kharkiv)
Types analysis of vehicle power plants: advantages and disadvantages
9. A. LAL, I. PARSADANOV (Kharkiv)
Modeling of the mixture formation process in a two-stroke diesel engine

September 5

Morning Meeting of Section

PISTON INTERNAL COMBUSTION ENGINES

September 5 9⁰⁰ – 13⁰⁰

Chairmen:	V. O. Pylyov,	Dr. Eng. (KhPI, Kharkiv);
	Yu. F. Gutarevych,	Dr. Eng. (KhPI, Kharkiv);
	Ye. V. Bilousov,	Dr. Eng. (KSMA, Kherson)
Secretary:	O. V. Bilohub,	Dr. Eng. (KhAI, Kharkiv).

1. O. V. BILOHUB (Kharkiv)
Profiling the surface of the pin hole in the piston body
2. A. P. MARCHENKO, V. V. PYLYOV (Kharkiv)
The problematics of ensuring the reliability of the side surface of the pistons of boosted ICES

3. O. U. LINKOV, V. V. PYLYOV, A. P. MARCHENKO,
S. O. KRAVCHENKO, G. V. MALISHEV, O. M. KLYMENKO
(Kharkiv)
Analysis of the causes of cylinder head failure of internal combustion engines
4. M. M. TKACHUK, A. V. GRABOVSKIY, M. K. NOVIKOV,
M. A. TKACHUK, S. O. KRAVCHENKO, O. S. LOZNYI
(Kharkiv)
Effects in discrete and continuous strengthening of machines elements
5. V. V. PYLYOV, O. Y. LINKOV, A. P. MARCHENKO (Kharkiv)
Refining the empirical model of the heat transfer boundary conditions of the piston of a high-speed diesel engine
6. R. VARBANETS, D. MINCHEV, Y. KUCHERENKO,
V. ZALozH (Odesa, Kherson)
Real-Time Diagnostics of Marine Diesels Based on Working Process Parameters
7. O. U. LINKOV, O. S. SHEVCHENKO (Kharkiv)
Use of IIoT technologies in engine monitoring and control systems
8. O. V. TRYNOV, D. G. SIVYKH, A. M. SERGIENKO (Kharkiv)
Automation of measurements of engine heat consumption in the lubrication and cooling systems
9. S. KRAVCHENKO, A. KUZMENKO, D. OBODETS (Kharkiv)
Using the Arduino platform in the research of internal combustion engines
10. V. M. BGANTSEV (Kharkiv)
Experimental evaluation of performance indicators of a small gas engine when simulating the conditions of its operation as a neutralizer of harmful emissions of fuel cells of energy complexes

Evening Meeting of Section
DESIGN AND STRENGTH

September 5 14⁰⁰ – 17⁰⁰

Chairmen: **S. R. Ignatovych,** Dr. Eng. (NAU, Kyiv);
 M. G. Shulzhenko, Dr. Eng. (IPS, Kyiv);
 S. V. Filipkovskii, Dr. Eng. (KhAI, Kharkiv)

Secretary: **A. A. Brunak** (KhAI, Kharkiv).

1. D. V. BOROVNIK, Yu. I. YEVDOKYMENKO, G. O. FROLOV
 (Kyiv)
 **Value of the thermal conductivity coefficient of composite
 carbon-carbon materials at temperatures up to 2000 °C**
2. I. P. GAVRYLOV, Y. V. VLASENKO, S. S. YUTSKEVYCH,
 O. Ye. YAKOBCHUK, O. M. KARUSKEVYCH (Kyiv)
 **Friction as a determining factor in the influence of film-forming
 anticorrosive compounds on the durability of riveted joints**
3. I. P. GAVRYLOV, S. R., IGTATOVYCH,
 M. V. KARUSKEVYCH, T. P. MASLAK,
 O. M. KARUSKEVYCH (KYIV)
 **Methodology for controlling the side effects of the application of
 aviation film-forming anti-corrosion compounds**
4. I. I. DZHAVADOVA, S. R. IGNATOVICH (Kyiv)
 **Stress intensity factor determination for aircraft structures by
 experimental and calculation methods**
5. M. TKACH, Y. HALYNKIN, Y. ZOLOTYY, A. MONAKHOV,
 S. DOTSENKO, I. GUK (Mykolayiv)
 **Experimental and calculation study of a tubular part with
 sections**
6. Ye. O. NEMANEZHYN, G. I. LVOV, Yu. I. TORBA
 (Zaporizhzhya)
 **Development of a method for determining the influence of
 anisotropic properties of single-crystal turbine blades of gas
 turbine engines on their long-term strength**

7. S. KRYHIN (Zaporizhzhya)
Study of relative deformations of aircraft engine parts under the influence of elevated temperatures using strain gauges
8. B. S. KARPINOS, V. V. SAMULEEV, A. S. BOLOHIN,
A. A. SHULHIN, Y. I. CHEMERYYS (Kyiv)
Computer simulation of thermocyclic damages of flame tubes of combustion chambers of aircraft engines
9. O. HALIENKOVA, R. SHAKALO, R. PRYDOROZHNYI,
O. OVCHINNYKOV (Zaporizhzhya)
Comparison of strength characteristics of turbine blades obtained from a standard and promising alloy based on titanium aluminide
10. A. V. BALALAEV, K. V. BALALAEVA, M. O. PIKUL,
G. G. GOLEMBIYEVSKYY (Kyiv)
Analysis of Campbell diagrams of fan tandem grid blades of turbofan engine made of composite and titanium alloy
11. S. FILINKOVSKII, S. CHAYKIN, (Kharkiv, Zaporizhzhya)
Analysis of nonlinear oscillations of a two-rotor system of turbofan with an inter-shaft support
12. I. VOJTENKO, V. CHYGRYN, Yu. TORBA (Zaporizhzhya)
Calculation of the critical flutter speed of the fan blades
13. K. PODGORS'KY, S. YEPIFANOV (Kharkiv, Zaporizhzhya)
Development of an elastic model of the fan shaft for determining the torque during tests
14. T. P. MYKHAILENKO, O. V. GORIDKO, I. I. PETUKHOV
(Kharkiv, Zaporizhzhya)
Modelling of the oil cooling process in an aircraft gas turbine engine
15. I. I. PETUKHOV, A. V. KOVALOV (Kharkiv)
Analysis of the pumping flow effect on the oil film parameters in the bearing chamber of a gas turbine engine

September 6

Morning Meeting of Section

AUTOMATIC CONTROL SYSTEMS AND DIAGNOSTICS

September 6 9⁰⁰ – 13⁰⁰

Chairmen: **N. I. Bouraou,** Dr. Eng. (KPI, Kyiv);
 S. V. Yepifanov, Dr. Eng. (NAU, Kharkiv);
 V. F. Myrhorod, Dr. Eng. (SC “Element”, Odesa);
Secretary: **Ya. S. Veklych** (KhAI, Kharkiv).

1. **N. I. BOURAOU, O. Ya. PAZDRII, O. A. POVSHENKO (Kyiv)**
 Use of multi-level processing of vibration signals for multi-class diagnostics of elements of complex rotating systems
2. **V. F. MYRHOROD, I. M. HVOZDEVA (Odesa)**
 Comparison of modeling methods of elastic transmission
3. **I. OHANYAN, S. YEPIFANOV**
 Development of methods for diagnosing the technical condition of the fuel regulator
4. **A. G. BURYACHENKO (Odesa)**
 Development of the torque meter imitator
5. **A. V. DUNAI (Odesa)**
 Selection of the optimal method for analyzing the operational data of the TV3-117V aircraft engine
6. **A. TSAREV (Odesa)**
 Improvement of the protection of aircraft DC starter generators against electrical damage
7. **S. VIALOV (Odesa)**
 Comparative analysis of programming methods for automatic testing systems of gas turbine engine controllers
8. **S. YEPIFANOV, O. BONDARENKO (Kharkiv)**
 Limited speed of the control influence consideration in the accuracy analysis of the gas generator dynamic characteristics identification

9. O. BONDARENKO (Kharkiv)
Dynamic performances identification of the two-spool turbofan
10. Ya. VEKLYCH, S. YEPIFANOV (Kharkiv)
Thermocouple mathematical model forming for the study of its dynamic characteristics
11. S. SVEZHENTSEV (Kharkiv)
Improving the life-time monitoring of main parts of gas turbine engine rotors taking into account the heat exchange in the oil chambers
12. O. PROKHOROVA, N. KALCHUK (Kharkiv)
About some historical aspects of the development of methods for solving optimization problems
13. S. S. TOVKACH (Kyiv)
Methodology for building adaptive control of an aircraft gas turbine engine based on wireless information exchange technology

Evening Meeting of Section

TECHNOLOGY

September 4 14⁰⁰ – 16³⁰

Chairmen: **A. Ya. Kachan,** Dr.Eng. (ZNTU, Zaporizhzhya);
 A. F. Sanin, Dr.Eng. (DNU, Dnipro);
 V. F. Sorokin, Dr.Eng. (KhNUUE, Kharkiv);
 Secretary: **V. V. Tretyak** PhD (KhAI, Kharkiv).

1. D. O. KUTS, V. S. YEFANOV (Zaporizhzhya)
Prospects of the application of additive technology in the production of parts of aviation GTE
2. O. PODOBNIYI, M. ALEYNIKOV (Zaporizhzhya)
Selection of 3D printing technology for application in “IVCHENKO-PROGRESS”

3. S. V. ADJAMSKIY, G. A. KONONENKO, R. V. PODOLSKYI,
S. I. BADUK (Dnipro)
The impact of a complex of production factors of the slip process on the quality in border volumes of products made of 316l steel
4. O. V. SHORINOV (Kharkiv)
Restoration of aviation engine parts with extreme damage by cold spraying
5. O. D. POPOV, V. F. SOROKIN (Kharkiv)
Determination of the effectiveness degree of ultrasonic cleaning in the contact method with increased hydrostatic pressure
6. Ye. A. STROCHAK, O. V. OVCHYNNYKOV,
O. V. ZAVGORODNY, R. Yu. BILYI, R. B. OSYPCHUK
(Zaporizhzhya)
Production of spherical powders from the aviation alloy Ti6Al-4V using alloyed sponge titanium
7. O. V. ZAVGORODNY, O. V. OVCHYNNYKOV,
M. M. PYASETSKYI, A. M. IVANIV, D. V. URIEKIN
(Zaporizhzhya)
Influence of rotational plasma spraying parameters on the size of spherical powders from heat-resistant alloys
8. S. G. MAKOVSKIY, V. L. GRESHTA, V. A. SHALOMEYEV
(Запоріжжя)
Volumetric modification of cast magnesium alloy ML5 with carbon black nanoparticles
9. S. M. DANILOV, D. O. TOMKIN, V. V. NAUMIK,
O. O. PEDASH (Zaporizhzhya)
Technological improvement of nickel superalloy structure and properties
10. K. BALUSHOK, S. CHIGILEJCHYK (Zaporizhzhya)
Repair of aviation engines parts made of fragile nickel alloys using additive plasma technologies
11. K. BALUSHOK, S. CHIGILEJCHYK (Zaporizhzhya)
The scope of the additive technologies application using the method of plasma deposition in the production of aviation engines

12. K. BALUSHOK, S. CHIGILEJCHYK, I. PETRYK, S. SAKHNO
(Zaporizhzhya)
Conditions for ensuring the operability of aviation parts made of nickel-ferrous alloys in additive manufacturing
13. K. BALUSHOK, S. PROKOPENKO, O. SELIVERSTOV,
S. SAKHNO (Zaporizhzhya)
Assessment of the possibility of detecting cracks during the control of LUM1-OV on turbine blades after fitting of complex heat-resistant coatings
14. K. BALUSHOK, S. PROKOPENKO, I. I. PETRYK
(Zaporizhzhya)
Magnetron spraying systems for applying heat-resistant coatings on turbine blades, implementation on existing equipment
15. V. YAKOVLEV (Zaporizhzhya)
Experience in manufacturing helicopter fuselage parts from composite materials on CNC machines

PLENARY MEETING

September 6 16³⁰

1. **Reports of section chairmen about the meetings**
2. **Summarizing the work of XXIX International Congress of Propulsion Engineering**
3. **Approving the Congress resolution**

**CLOSE
OF THE XXIX INTERNATIONAL CONGRESS
OF PROPULSION ENGINEERING**