




KARPENKO

PHYSICO-MECHANICAL INSTITUTE

NAS OF UKRAINE

 +380 322 633 088
 +380 322 649 427

 5 Naukova Str., Lviv
79060, Ukraine

 [www.ipm.lviv.ua/new/eng/
pminasu@ipm.lviv.ua](http://www.ipm.lviv.ua/new/eng/pminasu@ipm.lviv.ua)

ABOUT US



Karpenko Physico-Mechanical Institute of the National Academy of Sciences of Ukraine was founded in Lviv in 1951. Up to now it's the largest academic institution to the west of Ukraine. The Institute staff is about 350 people, among whom there are 2 Academicians and 5 Corresponding Members of the NAS of Ukraine, more than 40 Doctors of Science and more than 100 Philosophy Doctors.



For years of activity, the Institute has become a world-known research centre and the leading academic institution in Ukraine in the field of fracture mechanics and strength of materials, hydrogen materials science, physical and chemical processes during corrosion and protection of materials, non-destructive testing and technical diagnostics.



The theory of adsorption and hydrogen fatigue of steels and the theory of the boundary equilibrium of deformable bodies with crack-like defects are developed in the Institute. The new scientific direction – physical and chemical mechanics of materials was formed, which includes theoretical foundations of fracture and durability of structural materials with cracks under impact of stresses and (or) aggressive environments. It makes a possibility to evaluate workability and predict the destruction of structural elements. The mathematical theory of diffraction, the theory of signals, and the theory of electric circuits were significantly improved in the Institute. New methods of extraction and processing of information, signal processing and increase of noise immunity in technical diagnostics, geoscience and remote sensing are offered in the Institute.



The research results of the Institute are presented in about 350 monographs, among them there are fundamental works, such as “Fracture mechanics and strength of materials” (15 volumes) and “Technical diagnostics of materials and constructions” (8 volumes).

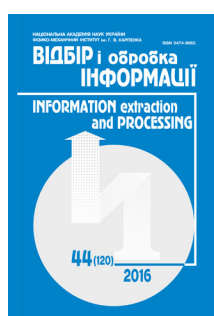


The scientific and technical achievements of the Institute were rewarded by the State Prizes of the USSR in the field of science and technology (two times), by the Awards of the Council of Ministers of the USSR (three times), the State Awards of Ukraine in the field of science and technology (10 times), Personal Awards of the National Academy of Sciences of Ukraine (19 times).

OUR JOURNALS



Physico-Chemical Mechanics of Materials is one of the leading journals on the problems of physicochemical mechanics of brittle fracture, service environment influence on material strength, theory, methods and technologies of metals protection against corrosion. The Journal is translated into English under the title *Materials Science* by Springer Publishing House.



Information Extraction and Processing is an authoritative journal in the field of theory of interaction of physical fields with heterogeneous environments; information technologies and measuring systems.

CONFERENCES

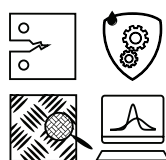
ORGANIZER



5th International Conference
"Fracture Mechanics of
Materials and Structural
Integrity"



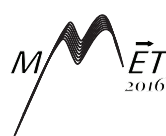
XIII International Conference
"Problems of Corrosion and
Corrosion Protection
of Structural Materials"



XXVth Open Scientific and
Technical Conference of
Young Scientists and Specialists
of IPM of NAS of Ukraine

III Scientific Conference
"Computational Methods
and Information Transformation
Systems"

CO-ORGANIZER



16th IEEE International
Conference on Mathematical
Methods in Electromagnetic
Theory

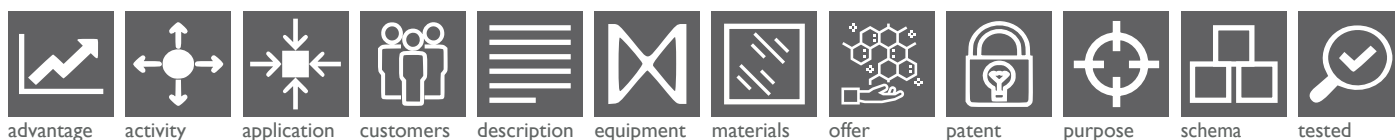


2017 IEEE International
Young Scientists Forum on
Applied Physics and Engineering

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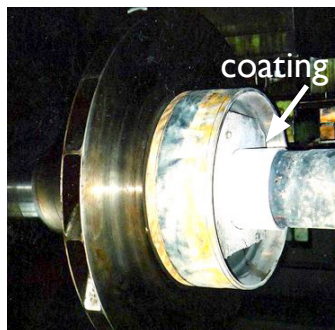
TECHNOLOGY & EQUIPMENT



Technology of Refreshing Details of Power Aggregates of Machines and Mechanisms



Restoration of basic necks turbine rotor compressor of gas compressor stations



The restored rotor of small size



Stationary electric arc spray gun, control unit, cassette unit and power supply



Mobile electric arc spray gun, control unit, cassette unit and power supply



Equipment for arc spraying is intended for spraying, wear-resistant, corrosion-resistant and other types of coatings. As electrode materials zinc, aluminum, as well as solid and powder wires with a melting temperature of up to 3000°C are used. Equipment is manufactured in Ukraine.



The working resource of restored parts is not lower, and often exceeds the new resource in 1.5-2 times. Electrode material used to form a wear resistant coating is original, patent protected, powdered wire Φ MI-2, cheaper than foreign analogues in 3-4 times and manufactured in Ukraine.



Ukrainian Patents · #40721, #86205, #71985

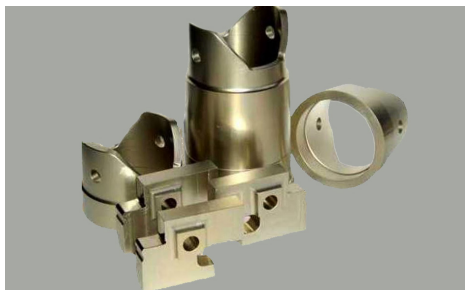


student-m-m@ipm.lviv.ua



+380 322 635 066
+380 322 296 648

Technology of Surface Strengthening of Titanium Alloys



Aviation products



Technology is designed to increase the wear- and fretting resistance of friction pairs from titanium alloys, including those working in the conditions of influence of particularly aggressive environments. *Technology* uses the gaseous components of multicomponent saturating environment as levers on the processes of phase formation and transformation of phases that allows, changing the technological saturation parameters (time and temperature, gas-dynamic), to change the intensity of physico-chemical processes on the interfaces and control the phase- structural state of surface layers, adjusting its functional properties in accordance to the operating conditions. *Technology* provides the formation of complex gradient strengthened layers with surface single-component and multicomponent functional films on titanium alloys by the thermodiffusion saturation under controlled gaseous environment.



Technology combining the formation of strengthened layer with set parameters and thermal treatment of the material matrix in the one technological cycle provides the regulated level of strength of heat-treatable ($\alpha+\beta$)-titanium alloys. *Technology* allows to treat the details of arbitrary configuration, including with holes of any diameter and length, using the serial vacuum electric furnaces. *Technology* provides the high surface quality, is used as the final technological operation, technologically simple and ecological.



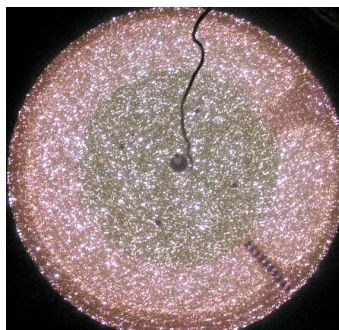
Ukrainian Patents · #50970, #51936, #9692, #62432, #62404, #31147



Plasma-Chemical Synthesis Method for Conversion Oxide- Ceramic Coatings Generation on Al, Mg, Ti and Zr Alloys



Wear-resistant coatings based on corundum synthesized on the surface of aluminum alloy leading and receiving cylinders on a printing machine Kosimax-Viva 340



Wear-resistant coatings based on corundum synthesized on the surface of aluminum alloy for packing machine of tablets

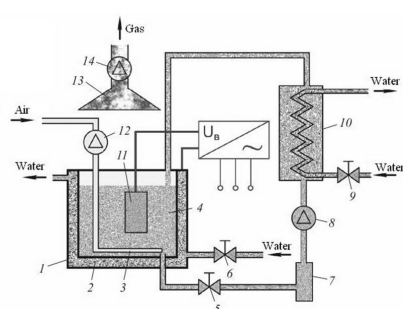


Antitease oxide-ceramics coating based on Ti alloys



General appearance of plasma electrolytic oxidation (PEO) equipment

Oxide type	Hardness, GPa	V_{MeO} / V_{Me}
MgO	8	0.79
TiO ₂	12	1.76
Al ₂ O ₃	25	1.31



Functional diagram of the installation PEO:

1 · electrolytic bath; 2 · water cooling jacket; 3 · barrier; 4 · electrolyte; 5, 6, 9 · stop valves; 7 · the filter; 8 · the water pump; 10 · tank with heat exchanger; 11 · detail; 12 · air compressor; 13 · exhaust hood; 14 · exhaust fan.



The goal of the technology is development of: the physical and technical basis of synthesis process in plasma of electric sparks of system metal-electrolyte oxide-ceramic coatings under action of inner electric field, which is applied to its system; the technology for creation of these coatings; the model of device for synthesis of oxide-ceramic coatings on Al, Mg, Ti and Zr alloys and its manufacturing.



Ukrainian Patents · #12333, #12335, #17243

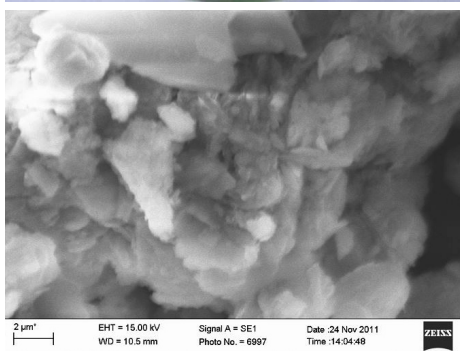


student-m-m@ipm.lviv.ua

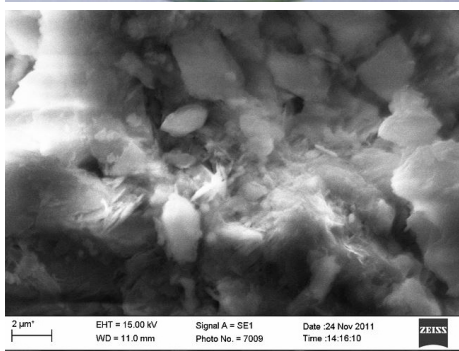


+380 322 635 066
+380 322 296 648

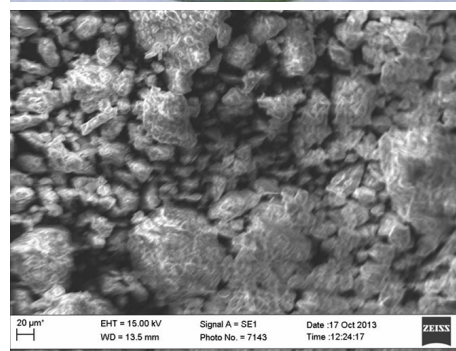
Inhibiting Pigments for Paints Based on Ion Modified Nanoporous Zeolite



Zn-zeolite



Ca-zeolite



Mn-zeolite



Zeolite based inhibiting pigments, modified by ion-exchange with zinc, calcium and manganese cations, are designed for improvement of protective properties of alkyd, epoxy, polyurethane and other organic coatings on steels and aluminium alloys.



The ion-exchanged pigments are environmentally friendly, chromate-free, can form a synergistic inhibiting composition with zinc phosphate and reduce under paint corrosion after addition to organic primer composition. Their performance is comparable with commercial inhibiting pigment Shieldex.



Organic coatings, containing the inhibitors, can be used for corrosion protection of aircrafts, transport vehicles, building structures and equipment of various industries under atmospheric conditions.



Ukrainian Patents · #78503, #99472



Experimental Production of Two-Component Injection Polymer Materials



General appearance of the Tashlynska HPSP in Pivdennoukrainsk, Mykolaiv region of Ukraine



General appearance of pillars of the bridge, damaged by cracks



Mobile diagnostic and restoration complex: arrangement of equipment packages inside the van



Repair-and-renewal operation in the foundation of the Museum of Ukrainian Arts, Lviv



Reparation of sculpture, Lviv



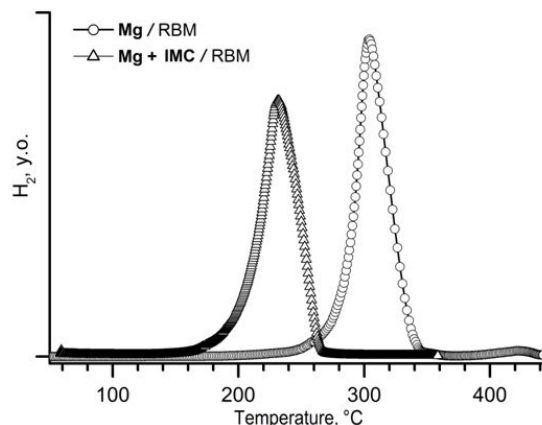
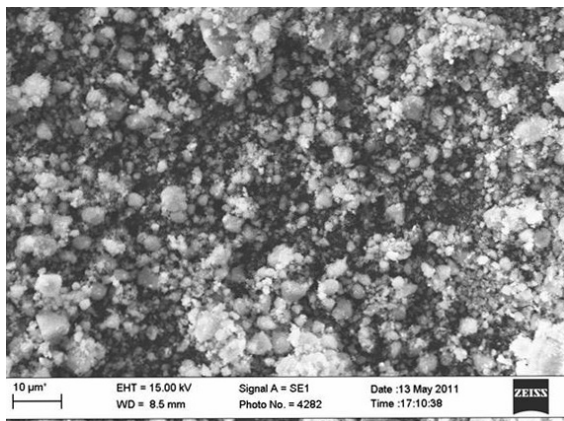
Together with State Engineering Center “Techno-Resurs” the formula for two-component polyurethane, polyurethane-silicon-organic and foam-polyurethane – silicon-organic compositions of Cold hardening was developed and technical specifications TY Y B.2.7-24.1-13803953-017-2011 for composition “Techno-PUR” were approved by the State Standard of Ukraine.



The polymer injection materials were tested and introduced during restoration of the crack-damaged concrete and iron-concrete constructions and structures of the Fuel-Power Complex and the Ministry of Regional Development and Construction of Ukraine.



Mg-Based Nanocomposite Materials for Effective Hydrogen Storage



Microstructure and spectra of thermal desorption for the Mg+10%IMC+3%C composite



The main feature of developed magnesium based composites (Mg-IMC, Mg-IMC-C) is that they are characterized by improved hydrogen sorption-desorption characteristics when suboxides are added. Ternary Mg-IMC-C composites possess also improved cyclic stability. Desorption of hydrogen from above mentioned composites is conducted under elevated temperatures (230 $^\circ\text{C}$). It is 100 $^\circ\text{C}$ lower than those for magnesium hydride obtained by reactive ball milling (RBM).



New magnesium based nanocomposite materials with catalytic additives for hydrogen storage and fuel cells have been developed. Magnesium based nanocomposite materials reversibly absorb about 6 wt.% H_2 . High hydrogen sorption capacity combined with low cost of the magnesium based alloys give a great advantage in hydrogen storage systems.



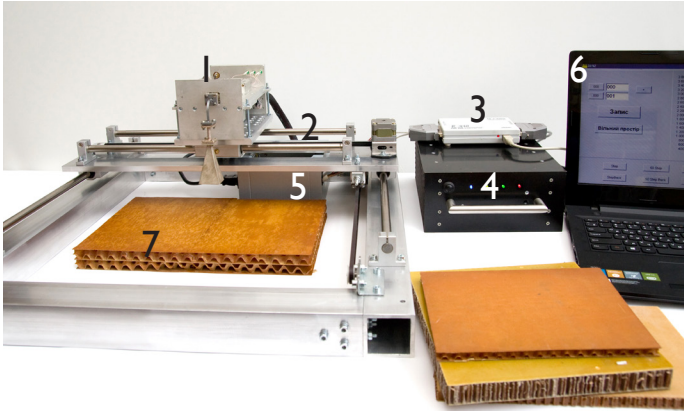
Ukrainian Patents · #94810, #110659



NDT & TECHNICAL DIAGNOSTICS



Microwave NDT of Plane-Layered Dielectric and Composite Structures



Equipment for microwave NDT of composite structures:

- 1 · microwave sensor with antenna;
- 2 · 2D scanner;
- 3 · control unit, DAC, ADC;
- 4 · SU of microwave sensor;
- 5 · scanner driver unit;
- 6 · PC;
- 7 · sample of material to be tested.

- > mode · FMCW;
- > wavelength range · 3 mm;
- > bandwidth · 3 GHz;
- > frequency of measurements · up to 1 kHz;

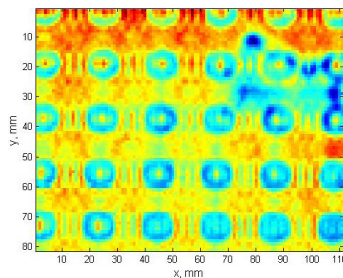
- > max. resolution in the plane · 2 mm;
- > speed of the sensor · up to 1 m/sec;
- > sensor size ~ 170 x 70 x 65 mm;
- > weight of sensor ~ 1.4 kg.



- > microwave imaging of internal structure;
- > detection of ply-separation and glue-peeling of composite materials, NDT of fiber-glass honeycomb structures;
- > monitoring of the protective dielectric coatings on the conducting and dielectric bases.



Fiberglass structure with cellular filler



Microwave image of defectless sample, plan

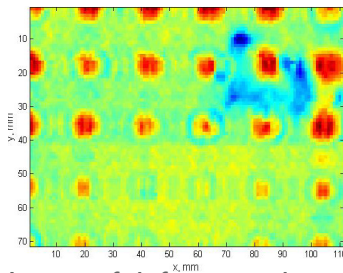
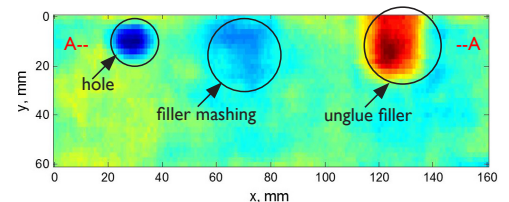


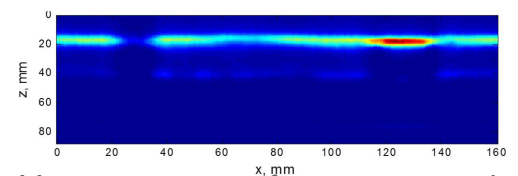
Image of defect sample, breakup of external sheet, plan



Composite panel with fiberglass sheets and polymer honeycomb filler



Microwave image of composite panel, plan



Microwave image of composite panel, profile A--A



Acoustic Emission System SKOP-8M



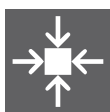
- > connection via USB-interface supports a high rate (12Mbit/sec) of data exchange between system and personal computer;
- > sensitivity to displacement of tested surface 10^{-13}m ;
- > when measured at the average geometric frequency of the operating range, error of measuring of enveloping AE signal amplitude does not exceed $\pm 2\text{dB}$;
- > error of determination of acoustic emission sources coordinates does not exceed 5% of the distance between AE sensors for central zone of the antenna;
- > consumption current $\cdot 350\text{ mA}$;
- > dimension $\cdot 370 \times 256 \times 30\text{ mm}$, weight $\cdot 2.1\text{ kg}$.



System SKOP-8M is assigned for extraction and processing of acoustic emission signals and signals on operating parameters of the unit under test (loading level, temperature, pressure etc.), as well as for determination of coordinates of acoustic emission sources which conduct structural materials fracture.



System portability allows to use it under both field conditions and hard-to-reach, high-altitude and other conditions of monitoring; simple and user friendly software interface and help system; compactness and successful structural implementation of the system; autonomous power supply of the system.



System could be used for monitoring and technical diagnostics of long-term operating objects: bridges, tanks, pressure vessel, pipelines, elements of bridge, gantry and tower cranes, port handling machinery, other constructions and mechanisms.



System SKOP-8M was tested during the diagnostics of bridges and overpasses, oil storage tanks, welds of passenger cars frames and trucks etc.



Ukrainian Patents \cdot #92941, #92944, #91142, #92537, #55661



rudavskyy@gmail.com
skalsky.v@gmail.com



+380 937 408 871
+380 322 631 264

Radio-Telemetry System of Acoustic Emission Monitoring



- > channels number · 8;
- > pre-amplifier gain · 35 dB;
- > logarithmic amplifier maximum gain · 92 dB;
- > sampling frequency of AE-signal envelope · 0.2 MHz;
- > AE channel of ADC · 12 bit;
- > error of AE signal arrival moment measurement at the channels · 1 μs;
- > dimensions: peripheral transceiver module: 170×83×24 mm, base transceiver module: 125×83×24 mm;
- > time of continuous operation of peripheral transceiver module · 12 h;
- > radio-frequency · 2.4 GHz;
- > estimated transmission distance · up to 100 m.



Telemetry AE-system allows monitoring a state of structure or equipment operating in conditions of harmful and explosive environments while increasing the efficiency and quality of diagnostics. The product is distinguished by a quick deployment at the high-altitude and hard-to-reach units under test as well as at the field conditions of its operating. It is significantly simpler and much cheaper from the point of view of channels number increasing, distinguished by high reliability of operating and etc.



System allows enhancing the efficiency of monitoring and diagnostics of products and structures, especially long operating and objects of increased danger, as well as objects operating at the field conditions. A single network for collection of data through the Internet can be effective built on the basis of this system.



The system was tested during the monitoring of oil-pump stations “Drohobych” and “Karpaty” of Lviv branch “Oil-trunk pipelines “Druzhba” of Joint Stock Company “Ukrtransnafta”; the diagnostics of bridges and overpasses, oil storage tanks, welds of passenger cars frames and trucks etc.



System was tested during the diagnostics of oil storage tanks, ground equipment of oil-pump stations.



Ukrainian Patents · #100073, #92941, #92944, #91142, #92537, #55661

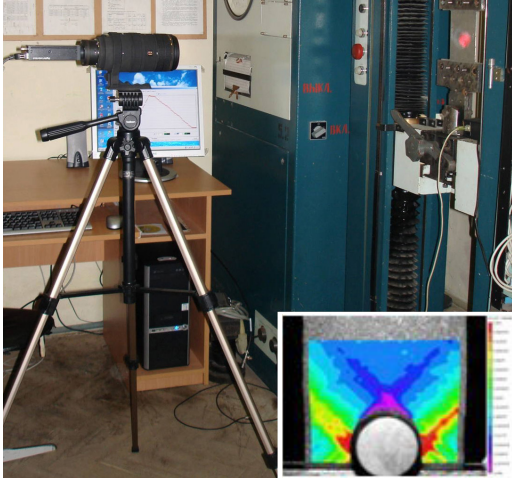


rudavskyy@gmail.com
skalsky.v@gmail.com



+380 937 408 871
+380 322 631 264

Hand-Held Optical-Digital Speckle Correlator



- > laser diode and LED sources for the surface illumination;
- > displacement range · from 1 to 1000 μm ;
- > deformation range · from 10^{-4} to 5×10^{-2} ;
- > adjusted field of view · from 5x5 mm to 100x100 mm;
- > frequency of frame recording · up to 40 Hz;
- > image processing time · up to 1 min.

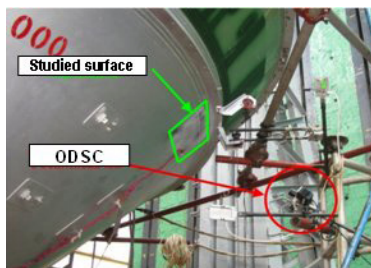
Strain field distribution near the composite-to-metal bolted joint



Hand-Held Optical-Digital Speckle Correlator (ODSC) is dedicated for remote testing of surface displacement and deformation fields of structural elements and specimens by using digital image correlation of speckle patterns.



- > wide range of measured displacements;
- > wide range of studied surface area dimensions;
- > cheaper price of the ODSC by an order in comparison with known prototypes;
- > portability of the device produced in hand-held version;
- > adaptation to control of real objects;
- > ODSC realizes original techniques for evaluation of crack resistance and bearing failure analysis of composite-to-composite and composite-to-metal bolted joints;
- > automatic control of cyclic loading and registration conditions.



Testing of a carrier rocket's fuel tank. Deformation and displacement control is fulfilled simultaneously by strain gages and the ODSC.



Ukrainian Patent · #116508



muravskyleon@gmail.com



+380 322 633 388

Method and Devices for Non-Contact Inspection of Underground Pipelines



Portable devices ORT, VP, ORT+V, ORT+V2, ORT-2016M for contactless search, determining the location of pipelines and for testing of electrochemical protection



BVC-2: non-contact meter of currents and depths of pipe laying, search by three methods, control of insulation quality. The economy effect of 1.6 million €/year



Device MGP to find and measure the depth of the pipeline and the electric potential



Device VPP for measuring of DC and AC electric voltages and polarization potential by a new method of extracting a resistance component



Devices VOZ for measuring of the resistance of ground and grounding in the area of EM hindrances



These are integral, differential and local methods of non-destructive testing. Quantitative estimations of parameters of passive and active protection against corrosion on different sections of underground pipes. Devices have high sensitivity and protection against interference, GPS, memory, small mass and sizes, low power consumption.



The devices are used by enterprises of pipeline transport and networks (gas, oil, water, chemical products) for supervision, inspections and control to prevent damages and accidents of underground pipelines.



dzhala@ipm.lviv.ua



+380 322 296 709
+380 673 713 485

Vibro-Diagnostic System “PULSE”



- > provides continuous 16-bit data acquisition via USB-2 interface;
- > four-channel architecture with analog-to-digital converter, switch, input buffer amplifiers and filters;
- > opportunity of software installation of sensitivity for each channel;
- > conversion rate of analog-to-digital converter is installed by software from 1 MHz to 10 MHz;
- > multi-mode synchronization of the start of data acquisition;
- > vibration sensors · piezo-ceramic accelerometers of the type ABS117 based on piezoceramic TSC 83G (lead titanate zirconate) with a resonant frequency of at least 100 kHz;
- > supply voltage 220 V;
- > consumption current not more than 250 mA.



The equipment is implemented at Burshtynskaya TPP, in the Odesa Trade Sea Port, the Experimental-Diagnostic Center DIALAB, PortTechExpert LLC.



Ukrainian Patents · #99358, #102759



roman.yuzefovych@gmail.com



+380 322 633 355
+380 322 296 340

Vibro-Diagnostic System “VECTOR”



- > number of input channels · 8;
- > maximal sampling frequency · 400 kHz;
- > bandwidth of input signal · 25 kHz;
- > maximal throughput on USB 500 kWords/sec;
- > range of input signal $\pm 10\text{ V}$, $\pm 2.5\text{ V}$, $\pm 0.625\text{ V}$, $\pm 0.156\text{ V}$;
- > voltage of cophased signal $\pm 10\text{ V}$;
- > conversion time – 25 μsec ;
- > input resistance at one channel input · 1 MOm;
- > supply: accumulator 12V, varying voltage 220 V.



Vibro-diagnostic system consists of: piezo-ceramic or electronic accelerometers; charge converter; analog commutator; channels of main amplification; synchronizing channel; channel for connection of etalon or another technical accelerometers for vibration measuring created by Bruel & Kjaer with construction Delta Tron; analog-digital converter E-440 created by L-card; power supply and personal computer and respective software for acquisition and processing of vibration signals.



Diagnostics System “VECTOR” is intended for acquisition and processing of multidimensional vibration signals, generated by rotary machineries, with aim of detection and prediction of emergency situations on turbo generators, oil-transfer stations, drilling equipment, diagnosis of rotary mechanisms, electromotors etc.



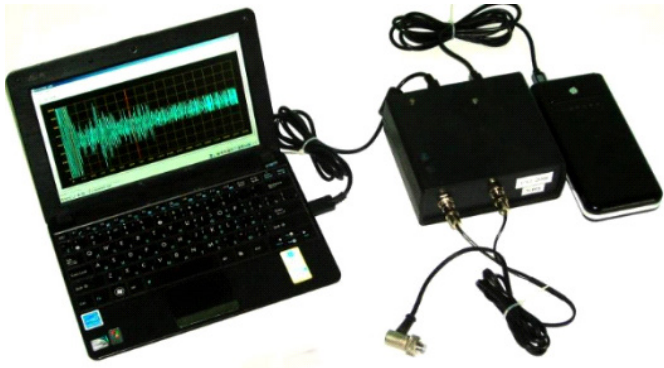
- > allows synchronous acquisition of vibration signals at many points on machinery in three dimensions (axial, horizontal and vertical);
- > allows operator to work on significant distance from mechanism because of using of double-railed lines of receiving-sending that minimize influence from possible power disturbances on signals;
- > using mutual analysis of deterministic and stochastic parts of vibration signals measured in the different points on mechanism allows to detect faults of rotary mechanisms at the early stage of their initiation;
- > uses methods of statistical estimation for vibration signals' probabilistic characteristics, that allows to define rate of present in the signals modulations and to estimate residual life of mechanisms with continuous service.



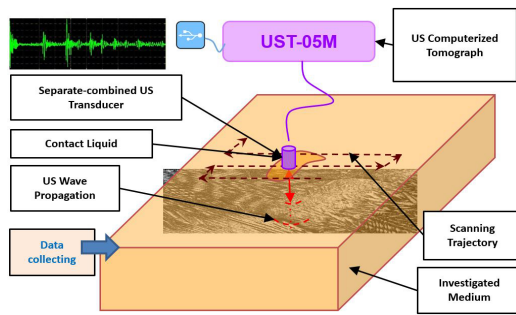
Ukrainian Patents · #99358, #102759



Portable Ultrasonic Tomograph UST-05M

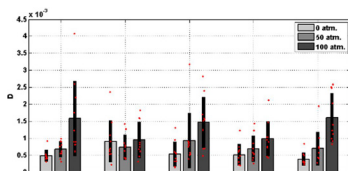
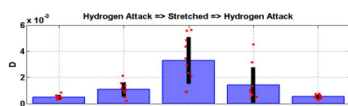


- > US transducer · separate-combined, 10MHz, 5MHz;
- > sampling frequency · 68MHz;
- > connection to PC · USB2.0, USB3.0;
- > record performance 500 ms per 2041-length signal;
- > supported features: A-scan, B-scan, C-scan, tomography, easy way to save data in MatLab for the advanced processing.

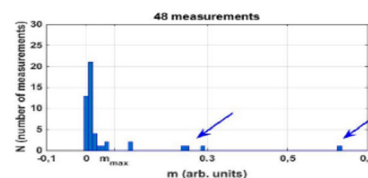
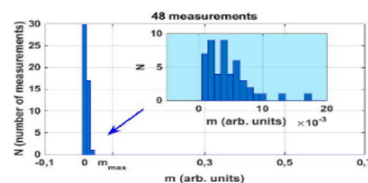


New ultrasonic computerized tomography (CT) combines methods for diagnostics of a “scattered damage” of metal with use of backscattered ultrasonic signals (“metal structural noise”) in the A-scan regime, US signals processing and statistical analysis, ultrasonic CT reconstruction of

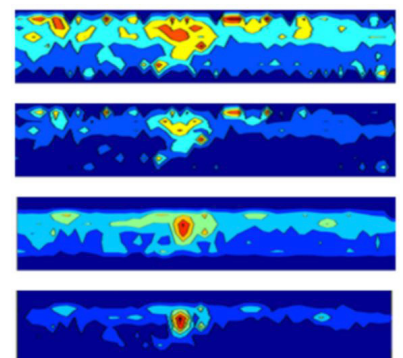
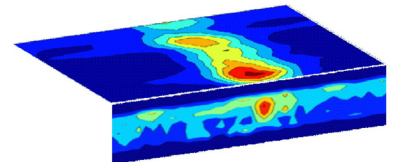
3D-distribution of material properties based on the backscattering signals processing, and tomographic images processing.



Hydrogen damage diagnostics



Thermal sprayed coating diagnostics



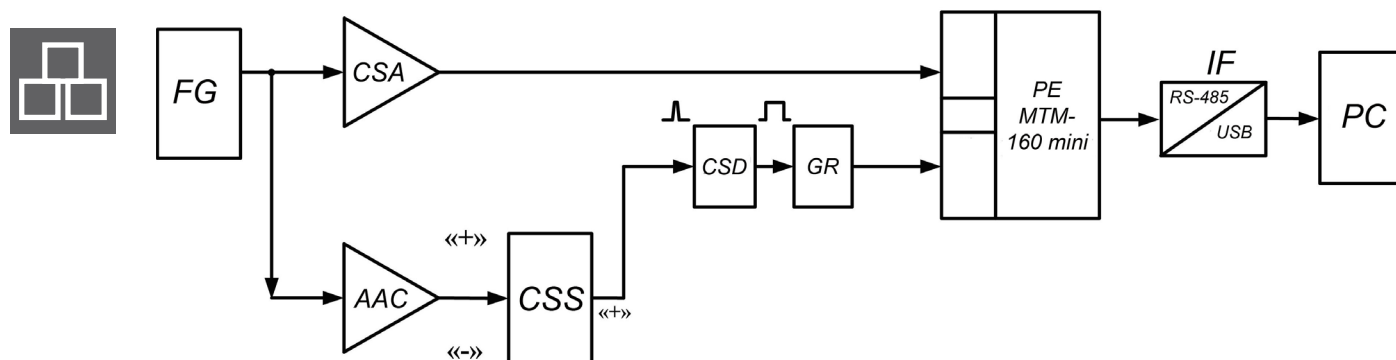
Weld joint diagnostics



Pulse Method of Continuous Corrosion-Mechanical Monitoring of Equipment of Chemical Industry



- > number of input channels · 2;
- > ranges of measuring:
1 channel · 0...1 V;
2 channel · -1.2...+1.2 V;
- > the number of registration points for each channel · 192512;
- > measurement error · $\pm 0.25\%$;
- > period of signal registration · 0.1 sec.



Structure chart of the pulse method of corrosion-mechanical monitoring: *FG* · fracture gauge; *CSA* · constant signal amplifier (potential); *AAS* · amplifier of alternating signal (fracture pulses); *CSS* · creator of standard signals level; *CSD* · creator of signal duration; *GR* · galvanic solution; *PE MTM-160* · electronic recorder; *IF* · interface; *PC* · computer.



Possibility to start the device monitoring at any operation stage, the lower necessity of preliminary experimental evaluation of the electrochemical characteristics of the deformed metal in certain environments, i.e. the necessity to take into account the steel grade, temperature and pressure of the environment etc.



The proposed method of corrosion monitoring of equipment was introduced at Lysychansk Company “Lynnyk” for checking the damage degree of connecting pipes and welded joints of the reboiler-evaporator case.



LABORATORIES



Laboratory of Certification

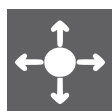
Tests of Corrosion Insulating Coatings of Pipelines



Certification of materials and coatings, development of new insulating materials; development of methods of prediction of durability and accelerated assessment of protective properties of coatings, development of normative documentation in this field.



Bituminous, tape and wrap materials, protective coatings on their basis (bitumen, compositions, mastics and coatings on their basis, materials bituminous, roofing and waterproofing, polymeric materials on the basis of PVC, tape insulating and wrapping materials, protective coatings on their basis); polymer materials: varnishes and paints, glues, compounds, protective materials and coatings, plastic products (materials for paintwork and coatings on their basis, glues and compounds, hermetics, polymerization resins are obtained by polycondensation and step polymerization, lubricants polymer products, pipes and pipeline details); heat-insulating and sound-proof materials, coatings, products and structures (organic heat-insulating materials, inorganic thermal insulation materials, geotextiles, non-woven cloths and construction.



- > certification tests of domestic and imported film, polymer, paint and varnish, mastic, anticorrosion coatings and heat-insulating materials, testing of new materials and structures of cover;
- > consultations, examination of normative and technical documentation, issuance of conclusions on the use of materials;
- > participation in conducting technical supervision of production of materials, control and acceptance tests of cover the objects;
- > development and approval of technical specifications and standards for materials;
- > development of test methods of materials, transfer of copies of laboratory-designed techniques, specifications, standards and other regulatory documents to customers for heat-insulating and anticorrosive materials;
- > research of physical-mechanical and protective properties of materials, participation in the development of new anticorrosive materials and coatings.



NAK Naftogaz of Ukraine, Ukrtransnafta, Ukrtransgas, Ukrnafta, OJSC Odessa Plant of Finishing Materials, Color Sim LLC, LLC "Pulsar & Co" LLC, Dashaw Plant of Composite Materials, DAT MN "Druzhba", "Naftogazbud" CJSC, Brovarsky Plastics Plant, Energoresurs Invest Corporation, Ukrtruboizol NPP, Tegola-Ukraine LLC, Color SIR LLC, Elplast-Teplo LLC, PE "Instalplast-KhV", DPIs "Tekhno-Resurs", DIVER LTD, etc.



dep43@ipm.lviv.ua
valdars@i.ua



+380 322 431 718
+380 322 634 066

Cooperative Center for Electron Microscopy and X-ray Microanalysis



General appearance of equipment of the Center



The Center for Electron Microscopy and X-ray Microanalysis was created on the basis of Department of Physical-Chemical Methods of Corrosion Protection of Metals at Karpenko Physico-Mechanical Institute for rational use of modern scientific equipment manufactured by Carl Zeiss (Germany) and Oxford Instruments (England).



The main purpose of the Center is conducting research in the field of materials science, corrosion science, in particular, studying the topography of the surface, chemical composition and microstructure of metal, ceramic, composite and polymeric materials and coatings.



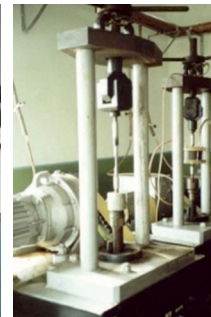
- > the possibility of conducting research on the modern scanning electron microscope “EVO-40XVP” with the system of X-ray spectral microanalysis “INCA Energy” for scientists from NAS of Ukraine and other scientific institutions of Western Ukraine;
- > consultations on use of modern methods of electron microscopy and X-ray microanalysis for studying of surface of metals and other materials, including preparation of test samples using of the Center equipment;
- > teaching specialists from industry, as well as MSc and PhD Students, to use electron microscopy and X-ray Microanalysis in materials study.



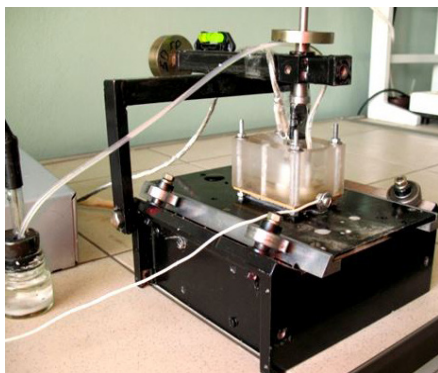
pokhmurs@ipm.lviv.ua
kornii@ipm.lviv.ua



+380 322 631 577
+380 322 638 096



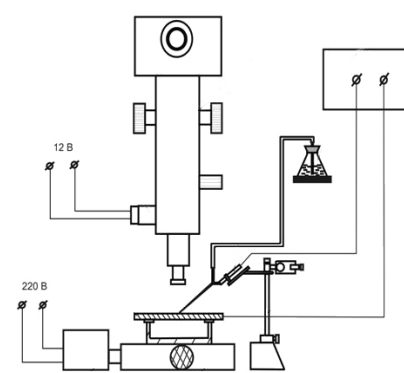
Corrosion cracking and fatigue



Tribocorrosion



Vacuum extraction
of hydrogen

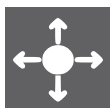


Microelectrochemical
studies



The department carries out the investigations in such directions:

- > the regularities of corrosion, hydrogenation and corrosion-mechanical destruction of steels and their welded joints in hydrogen sulfide and carbon dioxide environments;
- > tribological and tribocorrosion properties of metals in hydrogen sulfide and carbon dioxide environments;
- > methods of corrosion monitoring and protection of equipment during the operations at aggressive environments.



The following experimental methods are applied in our laboratory:

- > corrosion cracking, corrosion fatigue and tribocorrosion of metals in mineralized solutions with hydrogen sulfide;
- > micro- and macroelectrochemical methods for the investigation of corrosion processes;
- > microelectrochemical heterogeneity of metals in a moving drop;
- > X-ray and metallographic analysis;
- > vacuum extraction of hydrogen.



