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USSR

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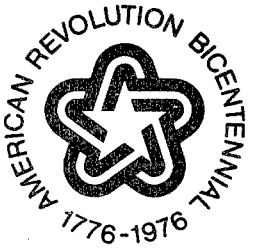
USSR AND EASTERN EUROPE SCIENTIFIC ABSTRACTS

ENGINEERING AND EQUIPMENT

No. 27



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USSR AND EASTERN EUROPE SCIENTIFIC ABSTRACTS

ENGINEERING AND EQUIPMENT

No. 27

This serial publication contains abstracts of articles from USSR and Eastern Europe scientific and technical journals on the specific subjects reflected in the table of contents.

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UDC 536.483.087.92

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SOLID ACOUSTIC CONTACTOR FOR TRANSDUCERS OPERATING AT CRYOGENIC TEMPERATURES

TRUDY VSESOYUZN. NAUCHNO-ISSLEDOVATEL'N. I PROYEKTNO-KONSTRUKTS. INSTITUTA TOKOV VYSOKOY CHASTOTY [Trans. All-Union Scientific-Research and Design-Engineering Institute of High-Frequency Currents] in Russian No 15, 1975 pp 236-241

[From REFERATIVNYY ZHURNAL, METROLOGIYA I IZMERITEL'NAYA TEKHNIKA No 7 1976 Abstract No 7.32.1085]

[Text] Various methods are considered of producing a solid acoustic contactor between the piezo element and the protective diaphragm for transducers operating within the -196 to -259°C temperature range. Included in the description are methods based on the use of indium for such a contactor, and the parameters are defined on the basis of which the quality of the acoustic as well as the mechanical contact can be evaluated.

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USSR

UDC 534.6.082.2:621.317.729.3.001.4

PROTOPOPOV, R.V., BOLTENKOV, V.A., LAT'YEV, B.V., and GASYUK, G.N.

CHECKING THE COMPONENTS OF HYDROACOUSTIC ANTENNAS ON THE ELECTRICAL SIDE

AKUSTICHESKAYA I UL'TRAZVUKOVAYA TEKHNIKA [Acoustic and Ultrasonic Engineering, Collection of All-Republic Interdepartmental Scientific-Technical Works] in Russian No 11, 1976 pp 41-47

[From REFERATIVNYY ZHURNAL, METROLOGIYA I IZMERITEL'NAYA TEKHNIKA No 7 1976 Abstract No 7.32.706]

[Text] Various methods of checking out the components of hydroacoustic antennas on the electrical side are analyzed theoretically, with regard to the kind of information they yield. The purpose of such a checkout is an automatic determination of the equivalent-circuit parameters of these transducers. It is shown here that most effective, in this respect, is the rough but fast determination of the frequency characteristic of the transducer conductance.

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USSR UDC 629.7.036.2:536.46

BAYEV, V. K., KLIMCHIK, G. V. and YASAKOV, V. A.

MIXING OF AN AXISYMMETRIC HYDROGEN JET IN AN ACCOMPANYING AIRFLOW

Novosibirsk AEROFIZICHESKIYE ISSLEDOVANIYA [Aerophysics Research, Collection of Works] in Russian No 5, 1975 pp 81-86

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.140 (résumé)]

[Text] Mixing of a hydrogen jet in an accompanying airflow was studied on an installation with air nozzle diameter of 36 mm, hydrogen nozzle diameter of 3.08 mm. The TE-80 Töpler instrument with field diameter of 80 mm was used to visualize the mixing zone. Concentration was determined from photometric data on the schlieren negatives. Figures 8, references 13.

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USSR UDC 532.526:532.542

YANKO, A. K. and PEREVEZEMTSEV, V. T.

ON CALCULATING THE THREE-DIMENSIONAL AXISYMMETRIC BOUNDARY LAYER IN THE CHANNEL FORMED BY TWO COAXIAL CYLINDERS

Kiev GAZODINAMIKA I KHARAKTERISTIKI AVIADVIGATELEY [Gasdynamics and Characteristics of Aircraft Engines, Collection of Works] in Russian No 1, 1975 pp 16-22

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.8]

[Text] An examination is made of procedural problems in calculating the three-dimensional axisymmetric boundary layer on the surface of coaxial cylinders. An integral method is used to solve the problem of motion in a swirling jet in the boundary-layer approximation with flow around outer and inner long coaxial cylinders. Integral boundary-layer expressions are found that can be used with the Karman-Pohlhausen method to determine the velocity profiles in the boundary layer. An equation is derived for numerical solution relative to the thickness of the boundary layer. Figure 1, references 6.

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USSR

AZATYAN, L. D., and BAGDOYEV, A. G. (Yerevan State University, Institute of Mechanics, Academy of Sciences Armenian SSR)

PENETRATION OF A WEDGE INTO AN ELECTROCONDUCTING FLUID IN THE PRESENCE OF A MAGNETIC FIELD

Yerevan IZVESTIYA AKADEMII NAUK ARMYANSKOY SSR - MEKHANIKA No 2, 76 pp 20-32

[English-language summary given in article]

[Text] Authors consider the problem of a blund wedge penetrating into a compressible fluid with a free surface for the case of a strong shock wave and the original magnetic field parallel to the free surface of the fluid. With initial magnetic field parallel to the undisturbed surface of the fluid, the line of magnetic force does not pass into the wedge; thus the problem may be solved independently of the field within the wedge. Parameters of the field in the region behind the shock wave are determined. The method of M.J. Lighthill ("The Diffraction of Blast, II," Proc. Roy. Soc., 1950, A, 200, 554-565) is used to

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AZATYAN, L.D., and BAGDOYEV, A. G., IZVESTIYA AKADEMII NAUK ARMYANSKOY SSR - MEKHANIKA, No 2, 76, pp 20-32

solve the boundary-layer problem for the analytical functions (pressure). Pressure distribution at the wedge is determined, and numerical values are tabulated. Tab 1 Bibl 5

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USSR UDC 621.039.526(02)

BURYAK, A.A.

BASIC PREMISES AND STAGES IN THE DEVELOPMENT OF BUILDING DOMESTIC NUCLEAR REACTORS ON FAST NEUTRONS

Kiev INSTITUT YADERNYKH ISSLEDOVANIY, AKADEMIYA NAUK UKR. SSR [Institute of Nuclear Research, Academy of Sciences UkrSSS] in Russian Preprint 75-18, 1975

[From REFERATIVNYY ZHURNAL, TEPLOENERGETIKA No 8 1976 Abstract No 8U13 K]

[Text] The amount of electric energy generated in the USSR increases by 7-8% annually. The total installed power of all electric stations has reached 205 million kW. The Soviet Union, earlier than other countries, began to tackle the problem of building fast reactors (1949). Initially a series of experimental low-power fast reactors was built (BR-1, BR-2, BR-3, BR-5, and BFS). Subsequently the BOR-60 nuclear reactor was installed in Melekess, delivering first 12 MW and by 1970 its full rated power. Over 20 years of development work on fast reactors with sodium cooling has yielded the experience necessary to build the first atomic electric power plants with fast reactors of the BN-350 and the BN-600 types. The very first such plant was installed in 1973. The basic characteristics and special features of domestically built fast reactors are shown here.

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USSR UDC 621.039.56:621.039.58

YEPANESHNIKOV, A. M., ZHUCHKOV, A. A. and TERENT'YEV, V. T.

USING A METHOD OF STATISTICAL TESTS TO ANALYZE THE RELIABILITY OF LOGIC STRUCTURES OF THE CONTROL AND PROTECTION SYSTEM OF A NUCLEAR REACTOR

Moscow PRIMENENIYE TSIFROVYKH I ANALOGOVYKH VYCHISLITEL'NYKH MASHIN V YADERNOY FIZIKE I TEKHNIKE [Using Digital and Analog Computers in Nuclear Physics and Engineering, Collection of Works] in Russian No 6, Atomizdat, 1975 pp 85-89

[From REFERATIVNYY ZHURNAL, YADERNYYE REAKTORY No 7, 1976 Abstract No 7.50.95 by K. Ye. V.]

[Text] It is proposed that a method of statistical tests on a digital computer be used to calculate the reliability of systems for control and protection of nuclear reactors. It is shown that with the introduction of simplifications that are not too severe it is possible to achieve acceptable accuracy of calculations with consideration of basic peculiarities of operation of the systems. The program realized in M-220 digital computer codes takes up about 1500 memory cells. The initial data may take up as many as 2200 cells. The program enables one to study circuits with models that contain up to 400 elements and satisfy up to 40 requirements. References 4.

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USSR UDC 532.525

KOPCHENOV, V. I.

NUMERICAL SOLUTION OF THE PROBLEM OF FLOW OF A MIXTURE OF GAS AND DISSIMILAR PARTICLES IN A LAVAL NOZZLE FOR A HIGH RELATIVE RATE OF PARTICLE CONSUMPTION

Khar'kov VOPROSY GAZOTERMODINAMIKI ENERGOUSTANOVOK [Problems of Thermal Gasdynamics of Power Plants, Collection of Works] in Russian No 2, 1975 pp 3-7

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.178 (résumé)]

[Text] Steady-state flow of a mixture of gas and dissimilar particles in a Laval nozzle is examined in the framework of the two-liquid model of a continuous medium for a high relative expenditure of particles (ratio of particles used to mixture used). In the case of a thin wall layer of pure gas formed due to particle lag the problem is solved in two stages. First a method of adjustment is used to calculate the main body of the flow where the particles are entrained by the gas, determination of the parameters in the pure gas layer being very approximate. Then from the known flow in the core, the distribution of parameters in the layer of pure gas is found by using simplified equations derived with the assumption of small thickness

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USSR

KOPCHENOV, V. I., VOPROSY GAZOTERMODINAMIKI ENERGOUSTANOVOK, No 2, 1975 pp 3-7

of the wall layer as compared with the characteristic dimensions of the problem, after which the solution in the main body of the flow is more precisely determined. Examples of calculation are given. Figures 3.

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USSR UDC 536.46

BAYEV, V. K. and YASAKOV, V. A.

STABILITY OF DIFFUSION FLAMES IN SUBMERGED JETS AND WAKES

Novosibirsk AEROFIZICHESKIYE ISSLEDOVANIYA [Aerophysics Research, Collection of Works] in Russian No 5, 1975 p 92

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.25 (résumé)]

[Text] To determine the way that the length of the zone of separation of a diffusion flame depends on the parameters of jet discharge in studying submerged flames and the influence of wake velocity on the length of the zone of separation, a special investigation was made on an installation comprising a system of two coaxial jets: the fuel was fed to the inside jet, and the oxidizer to the outside jet. The flame was photographed, and the negatives were photometrically interpreted. The experiments showed that for cold jets of propane and hydrogen and a cold wake of air the region of stable combustion is small. For hydrogen at its escape velocity of $u_j = 963$ m/s ($d_j = 3.0$ mm) an air velocity as low as $u_e = 19.35$ m/s leads to flame separation, and the fuel jet or air wake must be heated to ensure

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BAYEV, V. K. and YASAKOV, V. A., AEROFIZICHESKIYE ISSLEDOVANIYA, No 5, 1975 p 92

conditions of flame stabilization. In this research the air flow was heated by fire to temperatures ensuring spontaneous ignition of the mixture. Under these conditions the deciding criterion for the length of the zone of separation is the ratio of dynamic heads of the fuel jet and oxidizer.

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USSR UDC 629.7.036.3

ALEMASOV, V. YE. (editor)

HEAT PROCESSES AND PROPERTIES OF THE WORKING FLUIDS IN FLIGHT VEHICLE ENGINES. AIRCRAFT ENGINES

Kazan' TEPLOVYYE PROTSESSY I SVOYSTVA RABOCHIKH TEL DVIGATELEY LETATEL'NYKH APPARATOV. AVIATSIONNYYE DVIGATELI. TRUDY KAZANSKOGO AVIATSIONNOGO INSTITUTA [cf. English above. Works of Kazan' Aviation Institute] in Russian No 186, 1975, 47 pp

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.K (résumé)]

[Text] The collection contains articles on the aerothermochemistry of working processes in self-contained engines that use different kinds of fuels (liquid, gaseous, solid, hybrid). A second basic scientific area of the collection is the investigation of the properties of working fluids in flight vehicle engines. The bulk of the space in the study of working fluids is given over to products of combustion of chemical (primarily high-energy) fuels; these products are complex reacting media. An examination is also made of a low-temperature plasma under conditions that are typical of engines

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ALEMASOV, V. YE. (editor), TEPLOVYYE PROTSESSY I SVOYSTVA RABOCHIKH TEL DVIGATELEY LETATEL'NYKH APPARATOV. AVIATSIONNYYE DVIGATELI. TRUDY KAZANSKOGO AVIATSIONNOGO INSTITUTA, No 186, 1975

and power plants. An investigation is made of the thermodynamic, thermophysical and electrophysical properties of the combustion products and plasma.

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USSR

UDC 536.248.2.001.5

NIGMATULIN, R.I.

EXPERIMENTAL STUDY OF THE EFFECT OF NONUNIFORM HEAT GENERATION ALONG A CHANNEL ON THE CRITICAL HEAT TRANSFER DURING THE FLOW OF TWO-PHASE MEDIA

Kharkov VOPROSY GAZOTERMODINAMIKI ENERGOUSTANOVOK [Problems in the Gas Thermodynamics of Power Apparatus, Collection of Works] in Russian No 2, 1975 pp 117-121

[From REFERATIVNYY ZHURNAL, TEPLOENERGETIKA No 8 1976 Abstract No 8G78 by V.I. Kashinskiy]

[Text] An experimental study was made concerning the second kind of critical heat transfer during nonuniform heating along the channel with a flow of a two-phase medium. The tests were performed in a vertical pipe of grade 1Kh18N9T steel with an inside diameter of 8.0 mm and 1,800 mm long, heated with electric current. A cosinusoidal heating profile was achieved by varying the pipe thickness over its length (nonuniformity factor $q_{max}/q_{min} = 3.3$). The site of critical heat transfer was located by Chromel-Alumel thermocouples (welded to the outside surface of the pipe) indicating a sudden rise in the temperature and the thermal flux density was then calculated from the electric current and the electrical resistance of a given pipe segment, this resistance having been measured by the potentiometric method. Critical heat transfer was induced by increasing the heat

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NIGMATULIN, R.I., VOPROSY GAZOTERMODINAMIKI ENERGOUSTANOVOK No 2, 1975 pp 117-121
[From REFERATIVNYY ZHURNAL, TEPLOENERGETIKA No 8 1976 Abstract No 8G78]

load. With the data on the maximum steam content, it was possible to establish the limits on transition from a disperse-annular to a disperse stream structure as well as the conditions of drying of the water microfilm on the pipe surface. The conclusion based on the data analysis is that, within the test range of performance parameters, the maximum steam content under conditions of a cosinusoidal heating profile is almost the same as calculated according to well known analytical relations for the case of uniform heating.

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USSR UDC 629.7.064

KOLESNIKOV, A. F.

TRANSPORT EQUATIONS FOR HIGH-TEMPERATURE IONIZED MIXTURES OF GASES IN ELECTROMAGNETIC FIELDS

NAUCHNYYE TRUDY. INSTITUT MEKHANIKI MOSKOVSKOGO UNIVERSITETA [Scientific Works. Institute of Mechanics of Moscow University] in Russian No 39, 1975 pp 39-51

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.204 (résumé)]

[Text] An examination is made of a system of transport equations for a many-component partly ionized two-temperature mixture of gases that is solved relative to the "forces" in any approximation of the Chapman-Enskog method for cases where the transport coefficients can be limited in the calculation to the second approximation for heavy components and to the third approximation for electrons. As an example, all coefficients of this system are calculated for partly ionized nitrogen. References 22.

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USSR UDC 536.46

RYZHIK, A. B., LIMONOV, B. S. and MAKHIN, V. S.

A STUDY OF INDUCTION DELAYS WHEN IGNITING GAS SUSPENSIONS OF METAL POWDERS

FIZIKA AERODISPERSNYKH SISTEM. RESPUBLIKANSKIY MEZHVEDOMSTVENNYY NAUCHNYY SBORNIK [Physics of Aerodispersed Systems. Republic Interdepartmental Scientific Collection] in Russian No 12, 1975 pp 71-76

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.195 (résumé)]

[Text] The paper gives the results of an experimental determination of induction periods when igniting air suspensions of aluminum and 50/50 aluminum-magnesium alloy powders under tubular furnace conditions. An investigation is made of the influence that concentration of the solid phase and temperature of the medium have on induction delay. An empirical equation is derived in application to the conditions of the experiments that establishes a relation between ignition time, mean volumetric diameter of the particles and temperature. The resultant data are compared with the results of other authors and the conclusions of heat theory. Figures 3, references 15.

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USSR UDC 629.7.036.002.3

SUSLOV, O. N.

EFFECT OF SEPARATION OF CHEMICAL ELEMENTS ACCOMPANYING THERMOCHEMICAL DESTRUCTION OF A SOLID IN A STREAM OF PARTLY IONIZED CARBON DIOXIDE

NAUCHNYYE TRUDY. INSTITUT MEKHANIKI MOSKOVSKOGO UNIVERSITETA [Scientific Works. Institute of Mechanics of Moscow University] in Russian No 39, 1975 pp 52-61

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.156 (résumé)]

[Text] In thermochemical destruction of graphite and structural plates with a high coke content (Textolites including those with asbestos base) in a flow of partly ionized carbon dioxide an effect occurs that is attributed to the difference in diffusion properties of ions and atoms, and is essentially as follows: under certain conditions when the flowrate increases as the stagnation pressure remains constant the rate of destruction of the solid first drops and then begins to increase once more. In the case of graphite destruction in ionized air the effect of diffusion separation of chemical elements is also observed, but the rate of thermochemical destruction increases monotonically with flowrate. References 12.
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USSR UDC 536.46

ASLANOV, S. K. and KOPEYKA, P. I.

ON THE FINE STRUCTURE OF SPIN DETONATION

FIZIKA AERODISPERSNYKH SISTEM. RESPUBLIKANSKIY MEZHVEDOMSTVENNYY NAUCHNYY SBORNIK [Physics of Aerodispersed Systems. Republic Interdepartmental Scientific Collection] in Russian No 12, 1975 pp 91-95

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.27 (résumé)]

[Text] It is shown that spin fine structure is a consequence of instability of an oblique Mach jump and the presence of conditions therein for ignition of the gas mixture. As a result of periodically repeated effects of ignition and separation of the flame from the Mach wave downstream, a system of sequentially alternating zones of shock-compressed unreacted mixture and reaction products that move transversely to the detonation front arises. The interaction of the lines of contact of these zones with the transverse wavefront leads to the formation of breaks moving along the transverse shock, which outline the spin fine structure on track prints. Figures 2, references 13.

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USSR

UDC 536.423.1:621.4.45

DREGALIN, A. F. and MUKHAMETZYANOV, R. A.

NUMERICAL ESTIMATE OF THE INFLUENCE THAT A CHANGE IN CHEMICAL COMPOSITION AND PROPERTIES OF COMBUSTION PRODUCTS HAS ON THE PARAMETERS OF THE PROCESS OF VAPORIZATION

TRUDY KAZANSKOGO AVIATSIONNOGO INSTITUTA [Works of Kazan' Aviation Institute] in Russian No 186, 1975 pp 10-13

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.26 (résumé)]

[Text] A method is presented for determining the parameters of the process in a combustion chamber with consideration of equilibrium physicochemical transformations. The method is realized in a program for the M-220M computer. The results of the calculation illustrate the appreciable influence that a change in chemical composition of combustion products has on the parameters of the vaporization process. Figures 4, references 3.

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USSR

UDC 621.181.262

CHERTKOV, N.K., SHIKOLENKO, N.M., and RAYSKIY, Yu.B.

AUTOMATIC REGULATION OF THE TEMPERATURE OF SUPERHEATED STEAM IN A BOILER BY MEANS OF A TWO-LOOP SYSTEM WITH SEPARATE EFFECTUATION OF BOTH PERFORMANCE MODES

TRUDY VSESOYUZN. TEPLOENERGETICHESK. NAUCHNO-ISSLEDOVATEL'N. INSTITUTA, URALSKIY FILIAL [Trans. All-Union Scientific-Research Institute of Thermoenergetics, Ural Branch] in Russian No 12, 1976 pp 216-223

[From REFERATIVNYY ZHURNAL, TEPLOENERGETIKA No 8 1976 Abstract No 8S196]

[Text] A two-loop automatic regulation systems is proposed, with the PD-lead action and the PID-main action coming into effect separately. Both the proposed and the conventional system have been tested, on a comparative basis, in a model BKZ-210-140F boiler at the Chelyabinsk Heat and Electric Power Plant. An analysis of transient processes which follow perturbations due to injection has shown that the performance quality of the system proposed here is, according to the integral square-law criterion, 2.5 times higher than that of the conventional system.

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USSR

UDC 532.529.5:66.015.23.001.5

MASKAREV, V.K.

CONCENTRATION PROFILE OF POWDER IN A GAS-SUSPENSION FLUIDIZED BED

Sverdlovsk PYATAYA NAUCHNO-TEKHNICHESK. KONFERENTSIYA URALSK. POLITEKHNICHESK. INSTITUTA 1976. TESISY DOKLADOV SEKTSII TEPLOENERGETICHESK. FAKULTETA [Fifth Scientific-Technical Conference of the Ural Polytechnic Institute. Digest of Papers, Department of Thermoenergetics] in Russian No 6, 1976 p 78

[From REFERATIVNYY ZHURNAL, TEPLOENERGETIKA No 8 1976 Abstract No 8G45]

[Text] The concentration profile of a fine powder in a gas-suspension fluidized bed was measured in the channel (123 mm diameter) of a continuous-operation apparatus. Grade L corundum particles 80 u in size were used as the fine dispersion. The fluidized bed was 160 mm high when stationary and consisted of alundum balls 12.9 mm in diameter. The powder concentration at the discharge end was found to vary from 0 to 10 kg per kg of air. Addition of powder to the fluidizing agent was found to distort appreciably the velocity field of the latter.

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USSR

UDC 536.242.001.24

LEVIN, Ye.S.

OPTIMIZING THE GEOMETRY OF LAMINATED LONGITUDINAL RIBS IN A STREAM OF LIQUID

Sverdlovsk PYATAYA NAUCHNO-TEKHNICHESK. KONFERENTSIYA URALSK. POLITEKHNICHESK. INSTITUTA 1976. TESISY DOKLADOV SEKTSII TEPLOENERGETICHESK. FAKULTETA [Fifth Scientific-Technical Conference of the Ural Polytechnic Institute. Digest of Papers, Department of Thermoenergetics] in Russian No 6, 1976 pp 33-34

[From REFERATIVNYY ZHURNAL, TEPLOENERGETIKA No 8 1976 Abstract No 8G86]

[Text] Following channels were tested in both a laminar and a turbulent stream of turbine oil and water: 24 annular channels, including four smooth ones with different OD/ID ratios ranging from 1.19 to 186, and six such channels containing an inner tube (calorimeter) with 12, 24, or 32 laminated longitudinal ribs 1.86 or 2.64 mm high. Other channels in this study included pipes with laminated longitudinal ribs 60, 45, 30, or 15 mm long. The results of this experimental study are compared with those obtained for the same flow conditions by numerical and analytical methods.

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USSR UDC 389.14:658.562

BERGMAN, V. P., SHMAYEV, I. V., PIROGOV, V. S. and CHIKIREV, N. S.

EXPERIENCE IN IMPLEMENTATING AN OVERALL QUALITY CONTROL SYSTEM AT THE MOSCOW MACHINE BUILDING PLANT IMENI SERGO ORDZHONIKIDZE

Moscow IZMERITEL'NAYA TEKHNIKA in Russian, No 7, 1976 pp 3-5

[Abstract] The authors examine the role of production metrology in raising the quality of production output. At the end of 1975 the commission on quality of the October Rayon Committee of the Communist Party of the Soviet Union held a meeting, at which a study was made of the state of the art on raising the quality of production output. The commission approved an overall plan of measures designed for the further increase of quality of production output for the years 1976-1980. Discussions were made on processing parts with an accuracy on the order of several micrometers; such treatment requires the creation of heat-constant conditions for the finish treatment of the parts, assembly and control. Orders on reconstructing the plant included the construction of heat-constant rooms. Maintaining the temperature at

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BERGMAN, V. P., SHMAYEV, I. V., PIROGOV, V. S. and CHIKIREV, N. S., IZMERITEL'NAYA TEKHNIKA, No 7, 1976 pp 3-5

$20 \pm 1^{\circ}C$ in the mechanical assembly shops permits increasing the accuracy of manufacturing the parts by no less than 20% and reducing the work in assembly by 50%. Construction of a heat-constant section in the measurements laboratory ensures the necessary conditions for controlling the equipment and the instrument and checking the highly precise means of measurement. Realization of measurements forecast by the overall plan on quality permits the staff of the enterprise to bring production output with the state seal of quality up to 40% by the end of the tenth five year plan.

USSR UDC 629.7.036.3.002

YUNUSOV, F. S. and ABRAMOV, V. S.

DETERMINATION OF THE OPTIMUM POSITION OF THE VANE ON THE MANDREL WHEN MACHINING THE BLADE PROFILE

TRUDY KAZANSKOGO AVIATSIONNOGO INSTITUTA [Works of Kazan' Aviation Institute] in Russian No 192, 1975 pp 30-41

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.163 (résumé)]

[Text] An analytical method is outlined for calculating the optimum position of vanes on mandrels used for abrasive-belt grinding the blade of gas-turbine engine vanes on three-dimensional copying machine tools. The analytical expression found for the parameters that determine this position can be used to set up an algorithm for computer calculation. The proposed method enables objective determination of the most favorable position of the blade on the mandrel, reduction of the volume of work involved in designing the mandrels, simplification of the geometry and improvement of the stability of the cutting tool and follower, as well as improving machining conditions and thus increasing the accuracy and quality of making blades and similar items. Figures 4, references 5.
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USSR UDC 666.1.031

KOZLOVA, L. N., engineer, SHVORNEVA, L. I., candidate of Chemical Science, PRYANISHNIKOV, V. p., Doctor of Technical Science, State Scientific Research Institute of Glass and BYKOV, V. I., engineer, Leningrad Scientific Research Institute, State Institute for the Planning of Plants of the Basic Chemical Industry

A STUDY OF THE PROCESS OF GLASS FORMATION FROM SYNTHETIC MULTICOMPONENT SCHISTS

Moscow STEKLO I KERAMIKA in Russian No 8, Aug 76 pp 5-7

[Abstract] The process of glass formation from two synthetic, ortho-silica gel-based, schists was compared to that in normal schists and in a schist in which the sand was replaced with raw gel. X-ray phase analysis demonstrated analogous crystobalite emergence at low temperature and its conversion to tridymite at higher temperatures. However the absence of crystalline starting materials eliminates the silicate formation stage with its profuse evolution of gas. Using the synthetic plate glass schist the temperature of glass anealing can be reduced by at least 50°C, though the synthetic lead crystal schist required the same 1350°C as the usual schists. Glass from gel-based schists was more homogeneous and UV transparent. Figures 1; tables 1.
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USSR

ARTEMENKO, O. A., SUVARNO, V. V.

CALCULATION-EXPERIMENTAL STUDY OF THE TOTAL STRENGTH OF A DRY DOCK

SUDOSTR. I SUDOREMONT. VYP. 7 in Russian, Moscow 1976, pp 85-91

[Translated from REFERATIVNYY ZHURNAL MEKHANIKA No. 7, 1976 Abstract No. 7V1191 by the authors]

[Text] A study is made of the total strength of a dry dock with a capacity of 30,000 t. In the experimental study, a three-dimensional model was constructed to estimate the degree of participation of the bottom, dock floor and dock scaffolding in total bending, and a model was constructed for determination of the degree of stress concentration in the tower of the dock at points of interruption of floats in a scale of 1:70 (with 111 sensors) and 1:50 (with 35 sensors) respectively. The results of the experiment agree rather well with theoretical calculations using the method of finite elements run on a Minsk-32 computer.

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USSR UDC 621.311.22.002.52:621.186.3

SHRON, R.Z. and KORMAN, A.I.

CAPABILITY MARGIN OF WELDED JOINTS IN STEAM CONDUITS MADE OF GRADE 12Kh1MF STEEL

TRUDY VSESOYUZN. TEPLOENERGETICHESK. NAUCHNO-ISSLEDOVATEL'N. INSTITUTA, URALSKIY FILIAL [Trans. All-Union Scientific-Research Institute of Thermoenergetics, Ural Branch] in Russian No 12, 1976 pp 223-229

[From REFERATIVNYY ZHURNAL, TEPLOENERGETIKA No 8 1976 Abstract No 8S107]

[Text] It has been established that the bearing capability of welded joints in steam conduits made of grade 12Kh1MF steel and containing an annealed segment (soft interlayer) depends largely on the temperature and the service time, dropping faster with higher temperature and longer service time than does the bearing capability of the steel. In view of this, it seems appropriate to differentiate between the values of the strength factor at various operating temperatures. On the basis of preliminary data, the following values are suggested for welded joints of grade 12Kh1MF steel: $\varphi = 1.0$ up to 510°C, $\varphi = 0.8$ from 510 to 530°C, and $\varphi = 0.6$ from 530 to 550°C. This appreciable drop in the strength factor at temperatures above 540°C impairs the usefulness of the given material. In order to restore the bearing capability of steam conduits of grade 12 Kh1MF steel above 540°C, therefore, it becomes necessary to remove the soft interlayer by applying a full heat treatment. The heat resistance of the seam metal must, under these conditions, be on the same level as that of the base metal.
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USSR UDC 621.311.22.002.52:621.186.3.002.3

NOVITSKAYA, G.M., BULANOV, Yu.P., KRUTASOV, Ye.I., and SALAMATINA, A.I.

EXAMINING THE STATE OF THE METAL IN 300 MW UNITS FOR THE PURPOSE OF ESTABLISHING THE FEASIBILITY OF UPGRADING THE PERFORMANCE PARAMETERS TO THEIR NOMINAL VALUES

TRUDY VSESOYUZN. TEPLOENERGETICHESK. NAUCHNO-ISSLEDOVATEL'N. INSTITUTA, URALSKIY FILIAL [Trans. All-Union Scientific-Research Institute of Thermoenergetics, Ural Branch] in Russian No 12, 1976 pp 216-223

[From REFERATIVNYY ZHURNAL, TEPLOENERGETIKA No 8 1976 Abstract No 8S116]

[Text] Results of measurements and estimates are shown pertaining to the properties of the metal of which the piping for convective and intermediate-stage steam converters (grade Kh18N12T steel), the conduits for carrying live steam (grade 15Kh1M1F steel), and the piping for intermediate-stage superheaters (grade 12Kh1MF steel) in the 300 MW units of the Karmanov State Regional Electric Power Station are made. Recommendations are given for testing the performance, based on the feasibility of upgrading the latter to nominal levels.

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USSR UDC 662.753.325.001.5(47+57)

LUZHNOV, M.I., LIPSHTEYN, R.A., AVETISYAN, A.S., PSHENISNOV, I.F., GORELYY, A.F., KOSOBOKOVA, E.M., and BUKHANOVSKAYA, L.I.

TESTS OF GRADE M-40 BLACK OIL FROM THE OMSK PLANT WITH GRADE VTI-57 MONOAMMONIUM PHOSPHATE ADDITIVE IN A MODEL 6G GAS TURBINE OF THE "EKONOMAYZER" PLANT

TRUDY VSESOYUZN. TEPLOENERGETICHESK. NAUCHNO-ISSLEDOVATEL'N. INSTITUTA, URALSKIY FILIAL [Trans. All-Union Scientific-Research Institute of Thermoenergetics, Ural Branch] in Russian No 12, 1976 pp 141-148

[From REFERATIVNYY ZHURNAL, TEPLOENERGETIKA No 8 1976 Abstract No 8T44]

[Text] Specimens of grade 12Kh18N9T steel, used for component parts of gas turbines, were tested for resistance to vanadium corrosion in black oil with admixtures of ammonium phosphates at temperatures from 973 to 1173°K. Monoammonium phosphate (grade VTI-57) had been selected as the most effective additive. Its effectiveness was checked further, first in a laboratory gas turbine and then in an industrial turbine at an inlet temperature of 973°K. The effectiveness of this additive at temperatures from 973 to 1123°K was evaluated on a test stand. The procedure, the apparatus, and the result are shown here. The additive VTI-57 is recommended for use in industrial gas turbines.

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USSR UDC: 629.7.036.3:662.75

ENGLIN, B. A., SLITIKOVA, V. M., RADCHENKO, YE. D., ALIYEV, R. R. and SASHEVSKIY, V. V.

EFFECTIVENESS OF IONOL AS AN ANTIOXIDANT FOR JET FUELS MADE BY HYDROGENATION PROCESSES

KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 3, 1976 pp 16-22

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.17 (résumé)]

[Text] By using different laboratory methods for accelerated oxidation of fuels at 50-160°C an investigation is made of the effectiveness of Ionol as an antioxidant for RT, T-6 amd T-8 fuels produced by hydrogenation processes (hydropurification, deep hydrogenation and hydrocracking). It is established that adding 0.003% Ionol to such fuels appreciably improves their chemical stability and thus prevents oxidation of the fuels during long-term storage and use in aircraft equipment. The addition of this amount of Ionol to the fuel has no effect on working properties. Figures 2, tables 9, references 16.

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USSR UDC 771.523.6:771:531.351.3

MIKHAYLOV, V. YA. and SAMOLETOV, S. I., Central Scientific Research Institute of Geodesy, Aerial Photographing and Cartography

ON THE DEFORMATION OF PHOTOTECHNICAL FILMS ON A POLYESTER (LAWSON) BASE

Moscow ZHURNAL NAUCHNOY I PRIKLADNOY FOTOGRAFII I KINEMATOGRAFII in Russian, Vol 21, No 4, Jul-Aug 76, pp 295-297 manuscript received 5 Mar 76

[Abstract] Compared with a triacetate base, the Lawson one is found to be very promising, since its linear deformation is approximately 3 times smaller. However, in many instances significant random deformation is observed. The factors involved in using any base are found to be excellent for the Lawson base. This investigation was made based on the assumption that the reason for any significant random deformation is the non-optical relationship of the thickness of the emulsion layer and the backing. Tables 2.

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USSR UDC 666.593.2:666.295

GAYDASH, B. I., Candidate in Technical Sciences, DEREVYAGIN, G. F., Engineer, All-Union Scientific Research Center of Experimental Ceramics and DEREVYAGINA, A. A., Special Design and Technological Office on Insulators and Armatures, Power Supply Network Insulation Combine

GLAZES FOR HIGH-QUARTZ ELECTROTECHNICAL PORCELAIN

Moscow STEKLO I KERAMIKA in Russian No 8, Aug 76 pp 26-27

[Abstract] In order to prevent chipping and other defects observed after annealing of high-quartz electrotechnical porcelain insulation, three new brown glazes were developed. The changes in the thermal coefficient of linear expansion of the glazes and their effect on the basic characteristics of the porcelain were studied in relation to their content of alkali and alkaline earth oxides, chromate and manganic dyes, SiO_2 and Al_2O_3. The ratios of CaO and K_2O concentration to MnO and Na_2O concentration and that of SiO_2 content to Al_2O_3 content are significantly higher in the new glazes, as compared to present usage. A significant increase in the mechanical stability of porcelain was found with the new glazes, due to the correspondence of thermal coefficients of linear expansion. Spread, gloss and color were also improved. Petrographic studies showed that the new glazes exhibit a matted intermediate layer, almost saturated with mulite, with fewer air bibbles and insoluble dye grains. Figures 1; tables 4.

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USSR UDC 621.373.088.6:53.083.7

SAGAYDAK, M. V.

ELIMINATING SYSTEMATIC ERROR IN AVERAGING FLUCTUATING PHASE SHIFTS

Moscow IZMERITEL'NAYA TEKHNIKA in Russian, No 7, 1976 p 19

[Abstract] The author introduces the concept of directing the fluctuation of phase shift and establishes the vector criterion of distinguishability of two values of the phase shifts from different periods of the function $\varphi(l)$. The obtained criterion permitted developing a general-purpose method of eliminating systematic error in averaging the fluctuating phase shifts for the case when $\delta < 2\pi$. He makes a comparative analysis of the methods of scalar and vector criteria of distinguishability. References 4: 4 Russian.

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USSR UDC 772.9

GLADYR', V. I., YEGOROV, V. V., MURUGOV, V. M., PAN'SHIN, I. A., PODPALYY, YE. A. and SHEREMET'YEV, YU. N.

SPATIAL DISTRIBUTION REGISTER OF INFRARED RADIATION ENERGY DENSITY ON THE BASE OF THIN MAGNETIC FILMS

Moscow ZHURNAL NAUCHNOY I PRIKLADNOY FOTOGRAFII I KINEMATOGRAFII in Russian, Vol 21, No 4, Jul-Aug 76, pp 252-256 manuscript received 11 Sep 74

[Abstract] The authors suggest a simple and reliable method of determining the dependence of the angle of rotation of domains on the radiation energy density and demonstrate that this register has a dynamic range of 40 and a resolution of 6-7 pairs of lines/mm. They cite the results of registration of the radiation energy density distribution of a chemical laser at the face in the remote zone. They show that the results of the measurement of energy divergence of the optical laser with registers on a base of a thin magnetic film and electron-optical converter practically coincide. They describe a method of processing the results of the registration of radiation energy density distribution. Figures 6; references 9: 9 Russian.

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USSR

BULYANOV, Ye.V., GORDOVSKIY, N.K., KARNAUKH, I.M., PEL'TEK, I.F., and RATMANSKIY, A.Yu.

USE OF DETECTORS ON POLYCRYSTALLINE CdS FOR THE DOSIMETRY OF INTENSIVE PHOTON RADIATION FLUXES

Tashkent DOSIMETRIYA IONIZURUYUSHCHIKH IZLUCHENIY [Dosimetry of Ionizing Radiation, Collection of Works] in Russian, Izd-vo Fan, 1976 pp 133-134

[From REFERATIVNYY ZHURNAL, METROLOGIYA I IZMERITEL'NAYA TEKHNIKA No 7 1976 Abstract No 7.32.1838]

[Text] The parameters were measured of detectors on polycrystalline CdS whose inertia had been reduced by preintensification with radioactive isotopes. The dose measuring characteristics of these detectors were evaluated over a wide range of power. The gamma-energy dependence of the detector current was checked with the aid of Tu^{170} isotopes. The temperature characteristics of these detectors have been plotted. The detector circuits are also shown.

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USSR

UDC 539.166.074

BERLYAND, V.A., BONDAREV, V.D., BREGADZE, Yu.I., BRISKMAN, B.A., KRAMER-AGEYEV, Ye.A., PARKHOMOV, A.G., SKORIK, P.A., and TULTAYEV, A.V.

COMPARING THE READINGS OF CALORIMETERS OF VARIOUS DESIGNS USED FOR MEASURING THE SAME DOSE OF ABSORBED GAMMA RADIATION

Tashkent DOSIMETRIYA IONIZIRUYUSHCHIKH IZLUCHENIY [Dosimetry of Ionizing Radiation, Collection of Works] in Russian, Izd-vo Fan, 1976 pp 99-100

[From REFERATIVNYY ZHURNAL, METROLOGIYA I IZMERITEL'NAYA TEKHNIKA No 7 1976 Abstract No 7.32.1809]

[Text] Results of counting an absorbed radiation dose are reported and the calorimeters are briefly described which had been used for such a counting at the All-Union Scietific-Research Institute of Physicotechnical and Radiotechnical Measurements, branch of the L.Ya. Karpov Scientific-Research Physicochemical Institute, and at the Moscow Engineering Physics Institute. It is shown that the error of these calorimeters in determining an adsorbed dose is sufficiently small to render them suitable as standard instruments for gamma-radiation measurements.

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USSR UDC 621.3.035.2

GREKOVICH, A.L., MATEROVA, Ye.A., STEPANOVA, O.K., and YURINSKAYA, V.Ye.

AN ION-SELECTIVE ELECTRODE ON A VALINOMICIN BASE

Tbilisi MATERIALY VSESOYUZN. NAUCHNO-TEKHNICHESK. SOVESHCHANIYA "ANALITICHESKOYE PRIBOROSTROYENIYE. METODY I PRIBORY DLYA ANALIZA ZHIDKIKH SRED" [Papers All-Union Scientific-Technical Conference on "Analytical Instrument Design. Methods and Instruments for the Analysis of Liquid Media"] in Russian Vol 3, Part 1, 1975 pp 22-26

[From REFERATIVNYY ZHURNAL, METROLOGIYA I IZMERITEL'NAYA TEKHNIKA No 7 1976 Abstract No 7.32.1371 by B.-M., V.L.]

[Text] A dummy specimen of a gel electrode with potassium specificity was built at the Leningrad University and its properties then tested. The electrode membrane made of polyvinyl chloride (PVC) and dibutyl phthalate had been cemented to the end face of a PVC tube filled with a solution of KCl. Inside this tube was then also placed an AgCl electrode. The high potassium specificity of such an electrode in the presence of hydrogen ions renders it suitable for use in strongly acidic solutions (up to pH $\approx$ 0 in hydrochloric acid with an about 10^{-2} M concentration of potassium ions) up to pH $\sim$ 9.

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USSR UDC 536.5

SIMBIRSKIY, A.F.

IDENTIFIABILITY OF HEAT MEASURING SYSTEMS

Kharkov EKSPERIMENTAL'NYYE METODY TERMOPROCHNOSTI GAZOTURBINNYKH DVIGATELEY [Experimental Methods of Studying the Heat Resistance of Gas Turbines, Collection of Works] in Russian No 2, 1975 pp 3-16

[From REFERATIVNYY ZHURNAL, METROLOGIYA I IZMERITEL'NAYA TEKHNIKA No 7 1976 Abstract No 7.32.1062]

[Text] The reliability and the accuracy of thermal measurements are considered, in relation to the concept of practical identifiability of heat measuring systems. The discrepancy functions, whose form in the space of sought thermal parameters is of overriding significance, are derived from mathematical models representing the state and the prediction based on plant measurements. The conditions for practical identifiability of a heat measuring system are stipulated and appropriate algorithms for analyzing these conditions are shown. Recognized is, furthermore, how important the conditionality of the Graham matrix and the method of setting it up for a given system are.

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USSR UDC 536.5.533.9(083.76)(083.74)

ALL-UNION SYSTEM OF ASSURING UNIFIED MEASUREMENTS. ALL-UNION SPECIAL REFERENCE STANDARD AND CHECKOUT SYSTEM FOR PLASMA TEMPERATURES WITHIN THE 5,000-15,000°K RANGE IN THE INFRARED SPECTRUM

Moscow STANDADT SSSR, GOST 8.168-75 [USSR Standard, All-Union State Standard 8.168-75]

[From REFERATIVNYY ZHURNAL, METROLOGIYA I IZMERITEL'NAYA TEKHNIKA No 7 1976 Abstract No 7.32.1047]

[Text] The existing standard is extended to cover a special reference and checkout system for instruments which measure plasma temperatures within the 5,000-15,000°K range in the infrared spectrum, it defines the degree Kelvin as a unit of temperature within the 10,000-15,000°K range in the infrared spectrum, it specifies the basic instruments included in the system, it stipulates the basic performance parameters of the reference, and it describes the sequence in which the magnitude of the unit temperature is transferred from the special reference through secondary reference instruments to instruments for actual field measurements, indicating the the errors as well as the basic checkout procedure.

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USSR UDC 531.768(088.8)

BAZHENOV, V.I., GUROVICH, K.A., KOZLOV, Yu.N., and SHARIKOV, E.T.

A METHOD OF DETERMINING THE SCALE FACTOR OF AN ACCELEROMETER PENDULUM

USSR Patent Class G 01 p 21/00, No 463,912 filed 5 Jan 73 (No 1,869,090), disclosed 4 Sep 75

[From REFERATIVNYY ZHURNAL, METROLOGIYA I IZMERITEL'NAYA TEKHNIKA No 7 1976 Abstract No 7.32.668 P]

[Text] A method of calculating the scale factor of a pendulum-type accelerometer is proposed, namely from the signals it transmits when its measuring axis is oriented alternately in the two opposite directions along the earth's gravitation field. The accuracy of such a determination is improved by rotating, prior to a measurement, the accelerometer through $\pm 90^{\circ}$ about the horizontal axis perpendicular to the axis of the fulcrum and then measuring the accelerometer signals in these positions.

USSR UDC 531.781.2:681.787:778.38

ZHAVORONOK, I.V., KUTAYEVA, G.S., and KHE, V.I.

SEPARATION OF STRESSES IN PLANE MODELS BY THE METHOD OF HOLOGRAPHIC INTERFEROMETRY

Moscow TRUDY MOSKOVSK. INZHENERNO-STROITEL'N. INSTITUTA [Trans. Moscow Institute of Civil Engineering] in Russian No 125-126, 1975 pp 14-17

[From REFERATIVNYY ZHURNAL, METROLOGIYA I IZMERITEL'NAYA TEKHNIKA No 7 1976 Abstract No 7.32.625]

[Text] A report is given on the use of holographic interferometry for the separation of stresses, with the aid of fringe patterns resulting from the absolute difference of paths along sections of a model with a variable isocline parameter. Such fringe patterns, obtained holographically, are shown here along with diagrams depicting the distribution of principal stresses over a section of a plane model.

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USSR UDC 531.717.11.082.79.089.68:006

ALL-UNION SYSTEM OF ASSURING UNIFIED MEASUREMENTS. MEASURES OF SURFACE DENSITY FOR USE WITH RADIOISOTOPIC THICKNESS GAUGES. GENERAL TECHNICAL REQUIREMENTS

Mocow STANDART SSSR, GOST 8.171-75 [USSR Standard, All-Union State Standard 8.171-75] in Russian 1975

[From REFERATIVNYY ZHURNAL, METROLOGIYA I IZMERITEL'NAYA TEKHNIKA No 7 1976 Abstract No 7.32.306 S]

[Text] The existing standard is extended to cover measures of surface density, for duplicating the unit of surface density (g/m^2) as referred to sheet and tape material within the 5.0-5,000 g/m^2 range over surface areas from 5.0 to 600 cm^2 under normal conditions of use. Such standard measures should be used for the inspection (or calibration) of radioisotopic thickness gauges whose indicator scales comply with GOST 18061-72 and for checking their performance in accordance with GOST 13377-67.

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USSR UDC 531.14/15.087.92:620.1.05.088

ZAPIROV, M.F. and PLAKHUTIN, N.N.

CALCULATING THE KINEMATIC ERRORS OF A DYNAMIC TEST STAND

Ufa TRUDY UFIMSKOVO AVIATSIONNOVO INSTITUTA [Trans. Ufa Institute of Aviation in Russian No 85, 1975 pp 41-45]

[From REFERATIVNYY ZHURNAL, METROLOGIYA I IZMERITEL'NAYA TEKHNIKA No 7 1976 Abstract No 7.32.298 by P.N. Agaletskiy]

[Text] Methods are shown of using cam mechanisms on model UPG universal rotating stands, for measuring the dynamic characteristics of linear and angular displacements gauges. A procedure is also given for calculating the kinematic errors involved in the use of interchangeable programmed cams.

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USSR UDC 531.717.88

ACCURACY PROBLEMS IN MEASURING THE DIMENSIONS IN HEAVY-MACHINERY CONSTRUCTION

Irkutsk IRKUTSK AGRICULTURAL INSTITUTE in Russian 1975

[From REFERATIVNYY ZHURNAL, METROLOGIYA I IZMERITEL'NAYA TEKHNIKA No 7 1976 Abstract No 7.32.297]

[Text] Material is presented here about research that has been done toward the development of means and methods which will improve the accuracy of dimension measurements in heavy-machinery construction. Of concern are the theoretical problems and the practical feasibility of error compensation in certain types of measurements, including: measurement of large diameters and linear displacements by the roll method, measurement of large length and nonlinearities in structural metal parts of bridge cranes and of ground or rail equipment, and measurement of relatively flexible couplings. Reported are also basic data on new instrument designs and test data on the measurement performance characteristics of various types of instruments.

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USSR UDC 528.521:531.717.11.088

SPIRIDINOV, A.I.

BASIS FOR ACCURACY STANDARDS IN DETERMINING THE ERRORS OF DIAL DIAMETERS

Moscow TRUDY TSNII GEODEZII, AEROS'EMKI, I KARTOGRAFII [Trans. Central Scientific-Research Institute of Geodesy, Aerial Photography, and Cartography] in Russian No 214, 1975 pp 36-41

[From REFERATIVNYY ZHURNAL, METROLOGIYA I IZMERITEL'NAYA TEKHNIKA No 7 1976 Abstract No 7.32.41 by P.N. Agaletskiy]

[Text] The errors of the diameters of horizontal theodolite dials rank among the most important standardized parameters. The relation between the basic elements of tolerance inspection is determined by the composite laws characterizing the distributions of checked dimensions and measurement errors. Here the distribution of errors of theodolite dial diameters is analyzed. A procedure is shown for establishing the tolerance on these errors.

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USSR UDC 536.21.088.6.001

CHECHEL'NITSKIY, A.Z. and PUPKO, B.I.

HEAT TRANSFER FROM A SPECIMEN WITH NONCONDUCTIVE-SHIELDING INSULATION AROUND ITS CYLINDRICAL SURFACE

TRUDY METROLOGICH. INSTITUTOV SSSR, VNII METROLOGII [Trans. USSR Institutes of Measurement Science, All-Union Scientific-Research Institute of Measurements] in Russian No 187(247), 1976 pp 58-67

[From REFERATIVNYY ZHURNAL, METROLOGIYA I IZMERITEL'NAYA TEKHNIKA No 7 1976 Abstract No 7.32.1060 P]

[Text] The problem of determining the error due to lateral heat transfer from solids during measurement of their thermal conductivity is formulated here in sufficiently general terms and then solved. For the purpose of estimating this error, an analytical expression is derived describing the temperature field in a test specimen separated from the ambient medium by a set of five coaxial shields with an insulating filler. The problem is now solved in two stages. First the temperature distribution is found in the set of coaxial shields between an ambient heater around them and the insulating filler inside. This part of the problem has been reduced to a system of five integrodifferential equations and solved by the numerical method of matrix elimination. The temperature distribution in the innermost shield serves also as the boundary condition for the second part of the problem, where the temperature distribution in the

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USSR

CHACHEL'NITSKIY, A.Z. and PUPKO, B.I., TRUDY METROLOGICH. INSTITUTOV SSSR, VNII METROLOGII No 187(247), 1976 pp 58-67 [From REFERATIVNYY ZHURNAL, METROLOGIYA I IZMERITEL'NAYA TEKHNIKA No 7 1976 Abstract No 7.32.1060 P]

specimen-filler system is found. Subsequently, an analytical expression is obtained for the sought correction. As the mean test temperature varies from 370 to 1070°K and the ratio of the thermal conductivity of the insulating filler material to that of the specimen material varies from 0.015 to 0.5, the correction varies from 0.02 to 0.9%.

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USSR

UDC 127.825:624.642.5

FOTEYEVA, N. N., Doctor of Technical Sciences

DETERMINING THE STRESSES AROUND AN UNTIMBERED UNDERGROUND EXCAVATION WITH SEISMIC EFFECTS TAKEN INTO ACCOUNT

Moscow GIDROTEKHNICHESKOYE STROITEL'STVO in Russian No 1, 1976 pp 24-27

[Abstract] A method is proposed for determining the stresses around an underground excavation of arbitrary configuration (with one axis of symmetry) that are generated by the weight of the rock and the most unfavorable combination of seismic effects of the type, plane harmonic waves of compression or of tension and shear. A complete agorithm is given that is programmed for the "Mir" computer, and sample calculations are given. The method suggested may be applied to timbered excavations and used for determining the stress condition of icing in tunnels. Bibl 9.

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USSR

NIKISHIN, V. S., and SHAPIRO, G.S., Institute of the Problems of Mechanics Academy of Sciences USSR

CONTACT PROBLEM IN ELASTICITY THEORY FOR A LAYER LOCALLY BOUND TO A HALF SPACE

Yerevan IZVESTIYA AKAMEDII NAUK ARMYANSKOY SSR MEKHANIKA in Russian No 2, 76 pp 3-15 (amended English summary given in article)

[Abstract] Exact solutions of axially symmetrical problems in elasticity theory are obtained for weighable and unweighable layers of arbitrary thickness locally bound to a half space and having incomplete contact with the latter. The elastic characteristics of the layer and half space are given arbitrarily. Both problems are reduced to unhomogeneous Fredholm integral equations of the second kind, which are soluble by numerical methods. A numerical solution of an unweighable layer bound to a half space with regularly distributed load over an area of finite length is given as an example. The area radius of contact between layer and half space and pressure distribution over the area are estimated.

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USSR

NIKISHIN, V. S., and SPAPIRO, G. S., IZVESTIYA AKADEMII NAUK ARMYANSKOY SSR No 2, 76, pp 3-15

Tabulated data for the λ- parameter practically coincide with the data for the same parameter obtained by Keer, Dundurs, and Tsai ("Problems Involving a Receding Contact Between a Layer and a Half Space," Trans ASME, Ser. E, J. Appl. Mech. 1972, Vol 39, No 4).

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USSR UDC 621.438:621.565

GRITSENKO, V. I., PRIKHODCHENKO, A. V. and TERENT'YEV, YU. D.

ON CALCULATION OF HEATING AND COOLING POWER UNITS BASED ON GAS TURBINE AIRCRAFT ENGINES WITH SUPERCHARGERS

SBORNIK TRUDOV. OMSKIY POLITEKHNICHESKIY INSTITUT [Collected Works. Omsk Polytechnical Institute] in Russian No 3, 1975 pp 90-95

[From REFERATIVNYY ZHURNAL, TURBOSTROYENIYE No 7, 1976 Abstract No 7.49.187]

[Text] An examination is made of the design of a heating and cooling power unit that consists of a gas turbine installation (compressor, combustion chamber and gas turbine) in which the heat of the spent gases is used in a heat conversion section (recovery boiler, two feed heaters and two heat exchangers). The heat conversion section produces steam and hot water, and the cooled stream of spent gas is then used in the cooling section of the unit for cold production. This section includes a regenerator, a gas expansion engine, a refrigeration chamber and a blower. The power on the shaft of the gas expansion engine is used to drive the blower, which forces air into the compressor of the gas turbine installation. The addition of the blower to precompress the air complicates calculation of the installation.

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USSR

GRITSENKO, V. I., PRIKHODCHENKO, A. V. and TERENT'YEV, YU. D., SBORNIK TRUDOV. OMSKIY POLITEKHNICHESKIY INSTITUT, No 3, 1975 pp 90-95

This is due to the closed nature of the relation between the power on the shaft of the turbine expansion engine and the parameters of the gas and air flows; this relation reduces to interdependence of the air flowrate through the blower and gas turbine installation, and the pressure of the air beyond the blower and the gas after the gas turbine installation. An analytical relation is found between π_c in the compressor of the gas turbine installation and the blower. The technique developed can be used as a basis for subsequent more precise calculation of the unit. Figure 1, references 3.

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USSR UDC 629.7.036.2:533.697.4

VETLUTSKAYA, L. M., ZATOLOKA, V. V. and RYLOV, A. I.

DIVERGENT ASYMMETRIC NOZZLES

Novosibirsk AEROFIZICHESKIYE ISSLEDOVANIYA [Aerophysics Research, Collection of Works] in Russian No 5, 1975 pp 201-204

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.142 K (résumé)]

[Text] The nozzle of a hypersonic air-breathing jet engine having a combustion chamber with compact cross section must be divergent, i. e. it must ensure expansion of the jet cross section with respect to diverging intersection directions. In addition it must be asymmetric so as to fit into the flight vehicle configuration and have external expansion. The external flaring is necessary for satisfactory operation of the nozzle in overexpansion conditions. In addition to the nozzle mentioned, the authors also examined nozzles in the form of sectoral segments of axisymmetric divergent expansion flows with a corner point. The outlines of the nozzles were calculated with consideration of the flow field. The calculations were done by the method of characteristics on the BESM-6 computer. The authors

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VETLUTSKAYA, L. M., ZATOLOKA, V. V. and RYLOV, A. I., AEROFIZICHESKIYE ISSLEDOVANIYA, No 5, 1975 pp 201-204

calculated the contours of the nozzles, the flows in them and the thrust, lift and torques for different Mach numbers M_1 of hypersonic velocity at the nozzle inlet in the range $M_1 = 1.5$-3, and for different values of the angles of inclination of the long "upper" wall of the nozzle at the corner point, $\beta_1 = 10$-28°. The gas was considered inviscid and ideal with heat capacity ratio $\kappa = 1.26$.

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USSR UDC 621.438:621.565

GRITSENKO, V. I., GUBAYDULIN, N. L. and PRIKHODCHENKO, A. V.

INVESTIGATION OF A GAS TURBINE AIRCRAFT ENGINE WITH COMPRESSED AIR TAKEOFF FOR A HEATING AND COOLING POWER UNIT

SBORNIK TRUDOV. OMSKIY POLITEKHNICHESKIY INSTITUT [Collected Works. Omsk Polytechnical Institute] in Russian No 3, 1975 pp 84-89

[From REFERATIVNYY ZHURNAL, TURBOSTROYENIYE No 7, 1976 Abstract No 7.49.149]

[Text] The possibility of tapping off part of the compressed air from the compressor of a gas turbine engine extends the limits of regulation, enables production of different kinds of energy (heat in the form of steam, cold, and dry ice) in a heating and cooling power unit. For the purpose of determining and analyzing the characteristics of the investigated object, an experimental model based on the GTD-3 gas turbine engine was made and tested. The paper describes the design of the gas turbine engine for testing with air takeoff. The tests were done at constant turbocompressor speed under atmospheric conditions at the input to the compressor and with heating of the intake air from 25 to 46°C. Experimental curves are given for the change in temperature and pressure of the tapped air as a function of the amount of

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GRITSENKO, V. I., GUBAYDULIN, N. L. and PRIKHODCHENKO, A. V., SBORNIK TRUDOV. OMSKIY POLITEKHNICHESKIY INSTITUT, No 3, 1975 pp 84-89

air taken off at a compressor speed of 25,200 rpm with intake temperature of 25°C, and also for the change in fuel consumption and gas temperature at the tip of the intake nozzle. The authors give the calculated characteristics of the energy unit with respect to outside temperature at 25,200 rpm; air takeoff at an outside air temperature of 50°C is 1.22 kg/s; takeoff at a temperature of -50°C, based on limitations as to fuel consumption, rises to 1.8 kg/s; maximum gas temperature in the combustion chamber corresponding to an atmospheric air temperature of -50°C is 1200 K. The resultant characteristics are analyzed, and operating conditions are determined at a speed of 24,000-25,000 rpm. References 2.

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USSR UDC 629.7.036.54-66:532.551.001.2

VAZHINSKIY, G. A., GLAZUNOV, A. I., YERMOLAYEV, M. D. and SOKOLOV, B. I.

CALCULATION OF A DASHPOT WITH A GAS CUSHION IN THE FLUID CAVITY

TRUDY KAZANSKOGO AVIATSIONNOGO INSTITUTA [Works of Kazan' Aviation Institute] in Russian No 186, 1975 pp 36-42

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.180 (résumé)]

[Text] A method is proposed for calculating the dynamic characteristics of a dashpot with a gas cushion in the fluid cavity. A system of differential equations is presented that describes the work of the dashpot, and engineering curves are given. It is shown that when an air cushion is present in the fluid cavity, high-amplitude pressure oscillations arise, which must be taken into consideration when doing strength calculations on such dashpots. Figures 3, references 3.

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USSR UDC 629.7.035.3

TIKHONOV, N. D. and BOKOVOY, V. V.

DETERMINATION OF PERMISSIBLE WEAR OF THE FLOW SECTION OF A GAS TURBINE HELICOPTER ENGINE THAT OPERATES IN DUSTY AIR

Kiev GAZODINAMIKA I KHARAKTERISTIKI AVIADVIGATELEY [Gasdynamics and Characteristics of Aircraft Engines, Collection of Works] in Russian No 1, 1975 pp 38-54

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.107 (résumé)]

[Text] The paper gives the results of operational and stand tests of gas turbine helicopter engines in dusty air conditions at the engine intake. An examination is made of the relations found for the way that the main engine parameters depend on the total amount of dust that passes through, and of the criteria derived for the allowable wear of the gas-air section of the engine. Recommendations are made on checking the permissible wear of the flow section of the engine under operating conditions. Figures 11, references 3.

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USSR UDC 629.7.036.3:533.697.2

VAZHENINA, T. D., GRIN', V. T. and KRAYKO, A. N.

ON DETERMINING THE FREQUENCY CHARACTERISTICS OF AN AIR SCOOP CHANNEL

UCHENYYE ZAPISKI TSENTRAL'NOGO AERO-GIDRODINAMICHESKOGO INSTITUTA [Scientific Annals of the Central Aerohydrodynamics Institute] in Russian Vol 6, No 6, 1975 pp 30-40

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.106 (résumé)]

[Text] An approximate method is outlined for determining the frequency characteristics of an air scoop. The method is based on linearizing one-dimensional equations and relations on the closure jump that describe one-dimensional unsteady flow in a channel with variable cross sectional area. Examples are given of construction of the frequency characteristics for a harmonic change in pressure in the outlet section of the air scoop. The results found using the proposed method are compared with the results of numerical integration of the initial nonlinear equations. This comparison showed that the proposed method gives both correct qualitative and completely satisfactory quantitative information on the required frequency characteristics over a wide range of dimensionless frequencies. References 10.
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USSR UDC 629.7.036.3-57

KAZANDZHAN, P. K., DINEYEV, YU. N., SHULEKIN, V. T. and KARAPETYAN, M. I.

ON SELECTING THE MAIN PARAMETERS OF AUXILIARY POWER PLANTS

Kiev GAZODINAMIKA I KHARAKTERISTIKI AVIADVIGATELEY [Gasdynamics and Characteristics of Aircraft Engines, Collection of Works] in Russian No 1, 1975 pp 31-38

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.86 (résumé)]

[Text] The paper gives some results of an investigation of the hydraulic systems of auxiliary power plants with respect to the influence that parameters of the working process π_k^* and T_3^* have on variation of the specific equivalent power $N_{sp.\ eq.}$ and specific fuel consumption C_e. Of the systems examined, the most promising from the standpoint of choice of working parameters, the characteristics of the humidity control system and power takeoff is a two-shaft unit. Figures 9, references 2.

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USSR UDC 621.643.43.001.2

KRASNIKOV, A. S., KUDRICHENKO, G. P. and SID'KO, V. P.

FLEXIBLE METAL HOSES IN THE LINES OF AIRCRAFT ENGINES

TRUDY UFIMSKOGO AVIATSIONNOGO INSTITUTA [Works of Ufa Aviation Institute] in Russian No 46, 1975 pp 108-112

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.84 (résumé)]

[Text] The article discusses experience in the use of lines with limited flexibility on up-to-date items. An analysis is made of relations of length of a pipeline with limited flexibility for each item. The data given can be used in designing the lines for gas turbine engines. Figures 2, tables 2, reference 1.

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USSR UDC 536.6.013.12:62-135-226

MOTIN, I. I. and TIKHONOV, N. D.

INVESTIGATION OF THE INFLUENCE THAT LENGTHENING OF THE BLADES HAS ON THE CHARACTERISTICS OF OF A NEAR-SONIC COMPRESSOR STAGE

Kiev GAZODINAMIKA I KHARAKTERISTIKI AVIADVIGATELEY [Gasdynamics and Characteristics of Aircraft Engines, Collection of Works] in Russian No 1, 1975 pp 55-66

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.42 (résumé)]

[Text] The paper gives the results of an experimental study of two versions of a near-sonic compression stage that differ only in the elongation of the blades and of three flat compressor cascades. The study method is briefly described. An analysis is made of the results with respect to the influence of blade elongation on the characteristics of the compressor stage. Figures 7, references 5.

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USSR UDC 629.7.036:532.5

YANKO, A. K.

CALCULATION OF THE CHARACTERISTICS OF AN ELEMENTARY AXIAL COMPRESSOR STAGE FROM TEST DATA ON FLAT CASCADES

Kiev GAZODINAMIKA I KHARAKTERISTIKI AVIADVIGATELEY [Gasdynamics and Characteristics of Aircraft Engines, Collection of Works] in Russian No 1, 1975 pp 3-10

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.41 (résumé)]

[Text] The paper gives a procedure for calculating the characteristics of an elementary axial compressor stage with the use of actual experimental characteristics of flat cascades. The problem is solved for cases of flow of an ideal and real gas. In conclusion the author gives the results of "Mir-1" digital computer calculation of the characteristics of the working wheel and of the entire stage. Figures 3, references 3.

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USSR

UDC 621.514.5

ALESHIN, V. I.

ANALYSIS OF THE EXPEDIENCY OF USING HELICAL-GEAR COMPRESSORS IN VACUUM INSTALLATIONS

Moscow IZVESTIYA VUZOV MASHINOSTROYENIYE in Russian No 7, 76 pp 178-181 manuscript received 9 Dec 75

[Abstract] In view of the limited use of helical-gear compressors in the national economy and the scarcity of high-output vacuum pumps, the author investigates the possible use of helical-gear compressors as vacuum pumps in industry. A comparison is made between the main operational parameters, the space and energy requirements of modern mechanical vacuum pumps and the parameters and characteristics of an oil-filled helical-gear compressor operated as a vacuum pump in the exhauster mode. The latter is shown to be more efficient and is recommended for use in high-vacuum installations for the low-vacuum or prevacuum stage. Ill 1 Bibl 3

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USSR UDC 629.7.036.3:534.83

DAVIL'CHENKO, K. P., SURUS, V. I. and YEREMEYEV, V. L., Khar'kov Aviation Institute

A GAS FLOW MUFFLER

USSR AUTHOR'S CERTIFICATE No 47637 Division F, filed 18 Dec 72, published 29 Oct 75

[From REFERATIVNYY ZHURNAL, AVIATSIONNYYE I RAKETNYYE DVIGATELI No 7, 1976 Abstract No 7.34.148 P (résumé)]

[Text] The patent covers a gas stream silencer that contains baffle plates of sound-absorbing material installed sequentially in a casing to form channels that expand from the axis toward the periphery. To improve effectiveness, the baffle plates are made with a variable-thickness profile with thickness increasing downstream in accordance with the relation $C_{max}/b \cdot 100 \geqslant 15\%$, where C is the maximum thickness of the profile and b is the chord of the profile. The baffle plates are annular with variable radius decreasing downstream with ratio of outside to inside diameter of at least 2. figure 1.

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USSR UDC 621.452.3:621.643.02.053

YAZIK, A. V., SHUMILOV, S. P., PANURIN, V. M., VOLKOV, B. M., SHPAK, V. N. and LEUSENKO, A. P.

EXPERIENCE IN LONG-TERM OPERATION OF AIRCRAFT ENGINES ON A GAS MAIN

Moscow NAZEMNOYE PRIMENENIYE AVIADVIGATELEY V NARODNOM KHOZYAYSTVE [Ground-Based Use of Aircraft Engines in the National Economy, Collection of Works] in Russian No 2, 1976 pp 28-33

[From REFERATIVNYY ZHURNAL, TURBOSTROYENIYE No 7, 1976 Abstract No 7.49.151]

[Text] The paper describes experience in using the AGTU-5000 gas-pumping unit with an updated NK-12 aircraft engine for driving a gas pump. It is stated that the ground life of NK-12 engines that have been overhauled with replacement of the blades in the first stage of the compressor after completion of their service life in the air may be 8,000-10,000 hours.

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USSR UDC 629.II4.2-82.00I.24

KUGEL', R. V., KORNEYEV, V. N.

STUDY OF THE OPERATIONAL LOADING AND BASIC CAUSES OF WEAR OF TRACTOR HYDRAULIC SYSTEM DISTRIBUTORS

Moscow NADEZHNOST' I KONTROL' KACHESTVA in Russian No. 6, 1976 pp 3-8

[Abstract] One of the main conditions for proper operation of hydraulic systems is clean hydraulic fluid. The authors studied the influence of this factor of fluid contamination due to seal leakage on the example of the hydraulic suspension system and power steering system of the "Belarus'" tractor. Wearing of distributor parts during operation can be divided into three periods: running in, stable wear and accelerated wear (after 4000 hr). The mean wear rate of a valve couple is $4.75 \cdot 10^{-3}$ μm/hr at 4000 hr and $7.4 \cdot 10^{-3}$ μm/hr at 5000 hr. The limiting clearance in the valve couple for the suspension system is determined by the permissible settling of the tool during transportation (at the maximum leakage rate of 25 cm^3/min) and is determined to be 28μm. The minimum gap in a valve couple in the hydraulic steering unit is determined by the drop in volumetric efficiency of the power steering, resulting in 1.5-2 times increase in time

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KUGEL', R. V., KORNEYEV, V. N., NADEZHNOST' I KONTROL' KACHESTVA No. 6, 1976

delay of operation of the power cylinder. The maximum leakage, determined on this basis, is 1200 cm^3/min, corresponding to a gap of 48μm.

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USSR UDC 531.781.2(088.8)

BROSHEL', Yu.K., SUPRUNENKO, A.V., and FILIPPOV, V.F.

COMPARATIVE EVALUATION OF ELECTROTENSOMETRIC FORCE TRANSDUCER MODELS S4 AND ETV-04-02

NAUCHNIYE TRUDY VSESOYUZN. NAUCHNO-ISSLEDOVATEL'N. I PROYEKTNO-KONSTRUKTS. UGOL'N. INSTITUTA [Sci. Trans. All-Union Scientific-Research and Design-Engineering Institute of Coal] in Russian No 51, 1975 pp 230-233

[From REFERATIVNYY ZHURNAL, METROLOGIYA I IZMERITEL'NAYA TEKHNIKA No 7 1976 Abstract No 7.32.568]

[Text] It has been found that the serially manufactured model S4 force transducers are not suitable, on account of their insufficient stiffness, for accurate measurements of the load flow on a conveyor. Valid reasons are given for recommending the use of model ETV-4-02 transducers in such applications. The necessary test conditions are specified and a method of processing the test data is shown which will yield the basic performance parameters of these measuring devices.

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USSR UDC 539.1.074.5

BRAILOVSKIY, Ye. Yu., GALUSHKA, A.P., DUBOVOY, V.K., KONOZENSKO, I.D., and KOPAS', N.F.

SEMICONDUCTOR-TYPE DOSIMETERS OF IONIZING RADIATION

Tashkent DOSIMETRIYA IONIZIRUYUSHCHIKH IZLUCHENIY [Dosimetry of Ionizing Radiation, Collection of Works] in Russian, Izd-vo Fan, 1976 pp 135-137

[From REFERATIVNYY ZHURNAL, METROLOGIYA I IZMERITEL'NAYA TEKHNIKA No 7 1976 Abstract No 7.32.1818]

[Text] The devices described here include: 1) a dosimeter built on an n-type GaAs single crystal for measuring large doses (10^6-10^9 R) of gamma radiation from a Co^{60} source at any power level and any radiation temperature up to 150°C (the dose is determined here from the change in the impedance of the crystal due to radiative defects produced in the structure), 2) a dosimeter whose operation is based on a nonuniform resistivity in silicon and which measures the volume-gradient emf generated by the effect of ionizing radiation on the p^+-p junction resulting from a nonuniform distribution of active impurities in the Si single crystal, and 3) a radiation-resistant gamma dosimeter which is built on a CdS single crystal with compensating impurities and which measures the radiation intensity over the 0.1-3,000 R/s range at temperatures from -60 to +60°C.

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USSR UDC 681.121.087.92.089.6

BULYGIN, V.G. and YEGOROV, V.Ye.

CALIBRATION AND INSPECTION OF VIBRATOR-TYPE FLOW-RATE GAUGES

TRUDY VSESOYUZN. NAUCHNO-ISSLEDOVATEL'N. I PROYEKTNO-KONSTRUKTS. INSTITUTA KOMPLEKSNOY AVTOMATIZATSII NEFTYANOY I GAZOVOY PROMYSHLENNOSTI [Trans All-Union Scientific-Research and Design-Engineering Institute of Complex Automation of the Petroleum and Natural Gas Industry] in Russian No 6, 1975 pp 168-171

[From REFERATIVNYY ZHURNAL, METROLOGIYA I IZMERITEL'NAYA TEKHNIKA No 7 1976 Abstract No 7.32.911]

[Text] A method of calibrating and inspecting a model DVMR-1 vibrator-type flow-rate gauge is described, this method being based on the use of the output signal from the transducer of control-and-measuring devices. The relative error in the flow rate of water-air mixtures, measured in the laboratory with such a gauge, does not exceed $\pm 4\%$. On the basis of this principle, procedures have been developed for testing gauges which meet the technical requirements of the DVMR-1 model. The natural frequency, the damping coefficient, and the instrument constant determined during inspection may then be used also for checking the performance accuracy of secondary components of a vibrator-type flow(mass) meter.

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USSR UDC 778.37+621.397.331.1

GARKUSHA, O. G. and KORSUNSKIY, A. A., Institute of Organic Element Compounds of the USSR Academy of Sciences, Moscow

HIGH-SPEED MIRROR SCANNING WITH A CAPACITANCE PHASE COUNTER

Moscow ZHURNAL NAUCHNOY I PRIKLADNOY FOTOGRAFII I KINEMATOGRAFII in Russian, Vol 21, No 4, Jul-Aug 76, pp 267-270 manuscript received 6 Nov 74

[Abstract] The authors propose a design for a compact component used in high-speed mirror scanning; the component has a high mechanical reliability, low noise level, and a precise synchronization system. They have developed a special capacitance phase counter which makes it possible to obtain electrical pulses with a steep front and to ensure a high degree of synchronization precision. Figures 4; references 9: 6 Russian, 3 Western.

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USSR UDC 621.317.335.3.082.722

BUGROV, A. V., DUDKIN, N. I., and MASLENNIKOV, I. M.

SUPERPOSED CAPACITANCE CONVERTER WITH GUARD ELECTRODE

Moscow IZMERITEL'NAYA TEKHNIKA in Russian, No 7, 1976 pp 27-28

[Abstract] The authors of this article examine a new type of capacitance converter for measuring the dielectric constant by a contact-free method with an error no greater than 5%. It is used for varying the air gap between the product and the converter in the range from 0 to 1 mm. They demonstrate the method of computing the working capacitance and give the relationships for selecting the optimal dimensions of the converter. Figure 1; references 4: 4 Russian.

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USSR UDC 621.373.421.13.089.6:529.781

MURASHOV, B. P. and TSVETKOV, YU. P.

INSTRUMENT FOR CHECKING QUARTZ GENERATORS WITH SIGNALS OF SAMPLE FREQUENCIES IN THE LONG WAVE AND ULTRA LONG WAVE BANDS

Moscow IZMERITEL'NAYA TEKHNIKA in Russian, No 7, 1976 pp 51-53

[Abstract] The authors examine an instrument for checking quartz generators by signals of sample frequencies in the long wave and ultra long wave bands, including a device for standardizing the frequency of the quarts generators without reducing the frequencies of the checked and sample signals to a single nominal. They found that this instrument may be used as an insert for any high-precision device. Figures 2; references 3: 3 Russian.

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USSR

UDC 543.712.082.722

PODGORNYY, YU. V. and AVERIN, A. I.

POTASSIUM AND TFK HYGROMETERS

Moscow IZMERITEL'NAYA TEKHNIKA in Russian, No 7, 1976 pp 75-78

[Abstract] The authors of this article examine the operating principle, the structural features, the methods of calibrating and checking hygrometers designed for measuring the moisture content of potassium chloride in the range of 0-5% and TFK in the range of 0-1%. They demonstrate that these hygrometers may be widely used for checking the humidity of other mineral salts and finely disperse materials. Figures 4; references 10: 8 Russian, 2 Western.

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USSR UDC 778.534.83:778.532.5

SHCHEPETKIN, YU. P.

ABERRATIONS OF A BROAD MERIDIONAL BEAM IN HIGH-SPEED MOTION PICTURE CAMERAS TYPE SKS

Moscow ZHURNAL NAUCHNOY I PRIKLADNOY FOTOGRAFII I KINEMATOGRAFII in Russian, Vol 21, No 4, Jul-Aug 76, pp 241-245 manuscript received 4 Feb 74

[Abstract] The author of this article examines aberrations of broad meridional beams in high-speed motion picture cameras type SKS. In addition to previously obtained results he demonstrates that the aberrations in the image are not so small and harmless as would follow from several local reports and therefore in any serious study it is essential that ways should be sought to find effective methods of correcting them. Figures 3; table 1; references 4: 4 Russian.

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USSR UDC 778.534.83

DUBOVIK, A. S., BELINSKAYA, G. I., DRANOVSKIY, N. A., KOROLEV, I. A., MARKELOV, V. L., MODEL', N. M., CHUGAYEVA, V. N., CHERNOVA, T. I. and BELOVA, M. P., All-Union Scientific Research Institute of Optico-Physical Measurements

DEVELOPMENT OF A HIGH-SPEED GENERAL-PURPOSE PHOTOGRAPHIC CAMERA AND PHOTOCHRONOGRAPH TYPE VSFK-4

Moscow ZHURNAL NAUCHNOY I PRIKLADNOY FOTOGRAFII I KINEMATOGRAFII in Russian, Vol 21, No 4, Jul-Aug 76, pp 286-289 manuscript received 27 Nov 75

[Abstract] Many investigations require the use of a driven registration system and consequently today considerable attention is being paid to the development of such a system. Previous devices have not satisfied the stringent demands of modern science, thus a new device the VSFK-4 camera has been devised to answer these requirements. The authors list the technical data for the optico-mechanical system of the camera. Figures 3; reference 1: 1 Russian.

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EAST GERMANY

LENK, H., Dr of natural sciences, HODAM, F., chief engineer, and SANDERS, H., engineer, Central Institute for Optics and Spectroscopy of the Academy of Sciences of the German Democratic Republic

HOLOGRAPHIC CAMERA FOR A VARIETY OF METHODS

East Berlin FEINGERAETETECHNIK in German Vol 25 No 3, Mar 76 pp 105-107

[Abstract] The design, construction, operation, performance, and applications of a holographic camera system was described. The system is capable of carrying out Fresnel holography with incident and transmitted light, the corresponding reconstruction operations, straight-on holography, and — by using dual exposure and the special photographic cartridge — also hologram-interferometric measurements by means of the frozen-fringe and live-fringe techniques. The individual components (mirror assembly, collimators, cassette holder, measuring stage, observation system, and picture-taking system) were discussed. The versatility of the system was found to be a great advantage. Figures 10; no references.

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