Investigation of cavitation ...

this composition, fused onto steel 20GS-L possess an erosion resistance several times higher than that of heat-treated steel 1Kh13. The relationship between erosion resistance and hardness of a material is complex and not fully understood. Al bronzes containing 10 to 13% Al, both as cast and annealed, and in particular as cast and quenched, possess a high erosion resistance and can be recommended as materials for the manufacture of machine components subjected to cavitation erosion. Components of hydraulic machinery made from steel 20GS-L can be protected against cavitation erosion by fusing Al bronzes containing 11 to 13% Al onto them. The bronzes were fused onto steel 20GS-L in the Svarochnaya laboratoriya Khar'kovskogo turbinnogo zavoda im. S.M.Kirova (Welding Laboratory of the Khar'kov Turbines Works imeni S.M.Kirov) under the direction of the Laboratory Manager, Engineer S.I.German. N.S.Kurnakov is mentioned in the paper. There are 17 figures, 3 tables and 5 Soviet references.

Card 3/3

18.8300

28978
S/587/59/021/004/002/004
E091/E435

AUTHORS: Gavranek, V.V. and Bol'shutkin, D.N.

TITLE: X-ray investigation of cavitation erosion of monocrystals of aluminium

SOURCE: Khar'kov. Politekhnicheskiy institut. Trudy. v.21, no.4. 1959. Seriya metallurgicheskaya. 17-22

TEXT: It was found by V.V.Gavranek, M.Ya.Fuks and D.N.Bol'shutkin (Ref.1: Fizika metallov i metallovedeniye, 1955, v.1, no.3, 494) that erosion of metals under cavitation conditions is mainly the result of brittle fracture of crystals and that distortions of the crystal lattice caused by stresses of the second type develop only slightly in the initial stages of erosion. In order to obtain further information on the mechanism of cavitation destruction of materials, the authors investigated the structure of metallic monocrystals after they have been subjected to cavitation testing. Monocrystals of commercially pure Al were prepared by means of recrystallization annealing aluminium plates, 200 x 20 x 1 mm^3, which had first been deformed 3% in tension. Annealing was carried out at a temperature of 550°C, which was then raised to 590 and 630°C, the specimens being soaked at each temperature for

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4 hours and subsequently furnace-cooled. As a result, monocrystals 70 x 20 x 1 mm^3 were obtained. Specimens for cavitation testing on a magnetostriction vibrator were cut from the monocrystal plates in the form of discs of 18 mm diameter. These were secured to a nickel tube by means of a special holder and subjected to cavitation testing in de-aerated tap water at 25°C for 15, 30, 45, 50, 90, 120 and 300 sec at a tube oscillation frequency of 7500 c/s and constant oscillation amplitude. X-ray pictures were taken of the specimens before and after testing. It was found that cavitation erosion of monocrystals of aluminium is accompanied by intense break-down of these crystals into fragments, so that already after 45 sec the surface of the specimens becomes polycrystalline to a depth of 0.15 mm, the grain size being 10^{-4} cm. It was also found that the cavitation destruction of Al monocrystals does not cause great lattice distortions of the second stress type. The authors express the opinion that the brittle destruction of metals under conditions of cavitation erosion may be due to propagation of stress waves created by the impact action of cavitation bubbles. There are 6 figures and 5 references: 4 Soviet and 1 Russian translation of an English book. The

X-ray investigation of ...

reference to the English language publication reads as follows:
Ref.3: Barret, C.S., Structure of Metals. Russian translation
Metallurgizdat, 1948.

GAVRANEK, V. V.

S/129/60/000/06/019/022
E073/E535

AUTHOR: Minte, R. I., Candidate of Technical Sciences

TITLE: All Union Scientific-Technical Seminar on Improving the Cavitation Resistance of Components, Sverdlovsk

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1960, Nr 6, pp 58-60 (USSR)

ABSTRACT: The seminar was held at the initiative of the Problems Laboratory for Metallurgy at the Ural Polytechnical Institute imeni S. M. Kirov jointly with other organizations. In the seminar representatives of research establishments and works from Sverdlovsk, Perm', Chelyabinsk, Barnaul, Gor'kiy, Odessa, Leningrad, Yerevan, Murmansk, Khar'kov and other places participated. This report gives brief summaries of the following papers which were read:
G. D. Ter-Akopov, Candidate of Technical Sciences, "Cavitation failures in hydraulic turbines";
L. I. Ponerskiy, Engineer, "Cavitation in hydraulic turbines"; M. I. Kurasovich, Engineer, "Cavitation failures in runners of centrifugal pumps"; Marinin, A.A., Engineer, "Cavitation failures in marine propellers";

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N. N. Ivanchenko, Candidate of Technical Sciences, "Cavitation failures in diesel engines"; A.P.Chervyakov, Engineer, "Increase of the cavitation-erosion stability of jacket and cylinder liners of the diesel engines D6 and D12"; I.N. Bogachev, Doctor of Technical Sciences, "Mechanism of the cavitation failure of metallic alloys and principle for the selection of such alloys";
R.I. Minte, Candidate of Technical Sciences, "Combatting cavitation failure by using surface-active additions to the liquid phase of closed systems"; R.Sh. Shklyar, Candidate of Technical Sciences, D.D.Slyusareva, Engineer, and N.N.Syutkin, Engineer, "Structural changes in the initial stages of cavitation failure"; T.M.Petukhova, Engineer, "Influence of the structure on the resistance to cavitation of bronze"; V.K Gavranek, Candidate of Technical Sciences and D.N. Bol'shutkin, Engineer, "Cavitation erosion of metals, thermal and mechanical effects in the cavitation zone".

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S/126/60/009/05/012/025
E021/E335

AUTHORS: Bol'shutkin, D.N., Gavranek, V.V. and Fuks, M.Ya.

TITLE: X-ray Investigation of Cavitation Erosion of Metals

PERIODICAL: Fizika metallov it metallovedeniye, 1960, Vol 9, Nr 5, pp 722 - 725 (USSR)

ABSTRACT: Materials used were the stainless steel 1Kh13 and an aluminium monocrystal. Cavitation tests were carried out using a magnetostriction vibrator of a frequency of 7.5 kc/s and 0.065 mm amplitude. Each sample was photographed twice by a sharp focusing X-ray camera, focusing the lines (110) and (220). Distribution of the influence of the breaking-up of the crystallites of the mosaic and the size of microstresses, on the diffuse lines, was found by the method of approximation and the method of harmonic analysis. It was shown that cavitation erosion occurred in a similar way to brittle fracture, which has been shown to occur, in the main, by breaking up of crystallites with no substantial microstresses. After cavitation erosion for up to 20 min, the (110) lines of the 1Kh13 steel sample showed the presence of an axial texture [110] normal to the surface of the sample. This

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X-ray Investigation of Cavitation Erosion of Metals

was produced by preferred disintegration of crystallites with a favourable orientation. Monochromatic and polychromatic radiations were used for the investigation of aluminium. Figure 1a shows the presence of misorientation of fragments of the monocrystal. Figures 1b and c show that in the initial stages of the test, intensive progressive granulation occurred in individual crystallite fragments. Calculations showed that after 45 sec, the surface was polycrystalline to a depth of 0.15 mm. No substantial microstresses were found. Investigations were also carried out on copper samples. The initial grain size was 150 μ and the grain size of the powder as a result of cavitation erosion was 5 μ. No substantial microdeformation was noted. The results explain the increased cavitation stability of fine-grained alloys. The phase changes occurring in the process of cavitation erosion in the steel U7 were also studied. It was found that tempering of the hardened steel occurred and local temperatures of 450 to 500 °C were reached. There are 4 figures and 4 Soviet references.

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S/126/60/009/05/012/025
E021/E335

X-ray Investigation of Cavitation Erosion of Metals

ASSOCIATION: Khar'kovskiy politekhnicheskiy institut imeni V.I. Lenina (Khar'kov Polytechnical Institute imeni V.I. Lenin)

SUBMITTED: July 25, 1959

n.b. This paper was presented at the Sixth All-Union Conference on Applying X-rays for Investigating Materials, June, 1958.

Card 3/3

Gavranek, V.V.

S/126/60/010/01/010/019
E111/E335

AUTHORS: Gavranek, V.V., Bol'shutkin, D.N. and Zozulya, V.F.

TITLE: Microfractographic Investigation of the Cavitation Erosion of Metals

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol. 10, No. 1, pp. 84 - 89

TEXT: The authors describe their use of the technique of micro-examination of fractured surfaces, previously used by some other investigators (Refs.1-3) in studies of alloy fracture, for getting information on cavitation erosion of metals. Changes in relief of eroded metal after cavitation tests of various durations and the influence of heat treatment and chemical composition on relief structure of alloys were studied. Annealed type 1Kh13 chromium stainless steel, type U7 carbon steel hardened to martensite structure and tempered for 1 hour at 100-600 °C, types Br.A2, Br.A4 and Br.A6 aluminium bronzes in the annealed state and types Br.A10, Br.A12 and Br.A13 in both annealed and hardened states were studied. Cavitation tests were made with a magnetostriction vibrator (Ref.4) at 75. cps in water. Micro-examination of eroded specimens was effected with the aid of

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Microfractographic Investigation of the Cavitation Erosion of Metals

titanium replicas (Ref 5). Photographs were obtained with a type EM-3 electron microscope at X1200. The characteristic appearance of brittle-fracture relief type 08KP steel and ductile fracture of chromium-nickel steel are shown in Figure 1 (left- and right-hand, respectively). Orientation and size of planes was also determined and compared with erosion speed (Ref. 6). Fig. 2 illustrates the surface relief of type 1Kh13 steel in the peripheral and central parts of the specimen and after a 3-minute test and the same after 90 minutes. The reliefs of type U7 steel specimens after tempering at 100, 400 and 600 °C and cavitation testing for 3 hours are compared in Figure 3 and those of Br.A2, Br.A6 and Br.A13 aluminium bronzes after 3-hours' cavitation testing in Fig. 4. The relief obtained with specimens of hardened Br.A10 and Br.A13 aluminium bronzes after 3-hours' testing is shown in Fig. 5. With the alloys studied cavitation erosion occurs by way of brittle fracture of crystals. The size and mutual orientation of planes from which crystals have broken away determine the erosion stability of the alloy: the smaller the planes and the

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E111/E335

Microfractographic Investigation of the Cavitation Erosion of Metals

degree of their disorientation the greater the stability. Stability can be increased either by hardening and tempering or by additional alloying. There are 5 figures, 1 table and 7 references: 5 Soviet and 2 French.

ASSOCIATION: Khar'kovskiy politekhnicheskiy institut im. V.I. Lenina (Khar'kov Polytechnical Institute im. V.I. Lenin)

SUBMITTED: September 16, 1959

Card 3/3 VB

GAVRANEK, V.V.

82642
S/126/60/010/02/012/020
E021/E335

18.8200

AUTHORS: Gavranek, V.V., Bol'shutkin, D.N. and Zel'dovich, V.I.

TITLE: Thermal and Mechanical Action of a Cavitation Zone on the Surface of a Metal

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol. 10, No. 2, pp 262 - 268

TEXT: The present work is an attempt to examine the change in temperature and pressure impulses arising in the surface layers of a solid in the cavitation zone. A magnetostriction vibrator was used in the experiments with a constant amplitude of 0.06 mm and a frequency of 7.5 kc/s. Phase changes in a quenched U7 steel and D1 duralumin were investigated in the cavitation zone by microhardness and X-ray investigations. Fig. 2 shows the relation of microhardness with time of cavitation erosion. Fig. 2a is for the steel and 2b for duralumin. The changes in hardness show that the temperature of micro-volumes during cavitation erosion reaches 470 °C. Fig. 3 shows the effect of a preliminary tempering treatment at various temperatures on hardness (Curve 2) and rate of erosion (Curve 1). The rate of erosion is practically unchanged by preliminary heat treatments

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Thermal and Mechanical Action of a Cavitation Zone on the Surface of a Metal

up to 400 °C. This shows that the damage occurs on micro-volumes of metal, the temperature of which is up to 400 °C. X-ray investigations show that the internal stresses arising in the steel in the process of quenching are removed by cavitation erosion. Similar results were obtained for duralumin. During the experiments, the duralumin became artificially aged, showing that high temperatures are reached during cavitation erosion.

The obtained results can be summarised thus:

1) the mechanical and the thermal effects in the cavitation zone produced by the magnetostriction vibrator were calculated. It was found that in the case of using a 7.5 kg/s vibrator, the pressure increases periodically to 550 kg/cm^2 during a period of about 10^{-5} sec and acts on an area of about 10^{-5} mm^2. The micro-volumes of the metal bordering on the cavitation bubble are heated to 300 - 500 °C.

2) It was established that during the process of cavitation erosion, hardened steel is being tempered at temperatures up

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E021/E335

Thermal and Mechanical Action of a Cavitation Zone on the Surface of a Metal

to 470 °C.
3) The speeds of cavitation erosion of steel hardened to obtain a martensitic structure and of steel tempered at temperatures below 400 °C are practically equal.
There are 4 figures and 10 Soviet references.

ASSOCIATION: Khar'kovskiy politekhnicheskiy institut im. V.I. Lenina (Khar'kov Polytechnical Institute im. V.I. Lenin

SUBMITTED: June 26, 1959, originally,
February 17, 1960, after revision.

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PHASE I BOOK EXPLOITATION SOV/5011

Nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy promyshlennosti.
Kiyevskoye oblastnoye pravleniye.

Metallovedeniye i termicheskaya obrabotka (Physical Metallurgy and Heat Treatment of Metals) Moscow, Mashgiz, 1961. 330 p. Errata slip inserted. 5,000 copies printed.

Sponsoring Agency: Gosudarstvennyy nauchno-tekhnicheskiy komitet Soveta Ministrov UkrSSR. Nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy promyshlennosti. Kiyevskoye oblastnoye pravleniye.

Editorial Board: M. P. Braun, Doctor of Technical Sciences, I. Ya. Dekhtyar, Doctor of Technical Sciences, D. A. Dravgor, Doctor of Technical Sciences, I. S. Kaganchikoye, Engineer, Ye. A. Markovskiy, Candidate of Technical Sciences, V. G. Pereyaslov, Doctor of Technical Sciences, and A. V. Chechulin, Candidate of Technical Sciences; Ed.: M. S. Soroka; Tech. Ed.: M. S. Gorodetskaya; Chief Ed., Mashgiz (Southern Dept.): V. K. Serdyuk, Engineer.

Card 1/10

PURPOSE: This collection of articles is intended for scientific workers and technical personnel of research institutes, plants, and schools of higher technical education.

COVERAGE: The collection contains papers presented at a convention held in Kiyev on problems of physical metallurgy and methods of the heat treatment of metals applied in the machine industry. Phase transformations in metals and alloys are discussed, and results of investigations conducted to ascertain the effect of heat treatment on the quality of metal are analyzed. The possibility of obtaining metals with given mechanical properties is discussed, and are problems of steel brittleness. The collection includes papers dealing with kinetics of transformation, heat treatment, and properties of cast iron. No personalities are mentioned. Articles are accompanied by references, mostly Soviet.

TABLE OF CONTENTS:

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GAVRANEK, V.V., kand.tekhn.nauk, dotsent; BOL'SHUTKIN, D.N., kand.tekhn.nauk; VOLONTSEVICH, O.A., inzh.

Investigating the erosion strength of steel hardened by electric spark treatment and subjected to grinding. Vest.mashinostr. 43 no.9:62-64 S '63. (MIRA 16:10)

GAVRANEK, V.V., inzh.; FEDOROVA, L.N., inzh.

Ultrasonic testing of the structure of stamped articles.
Mashinostroenie no.4:66-68 Jl-Ag '64. (MIRA 17:10)

FOMINA, O.P.; GAVRANEK, V.V.; D'YACHENKO, S.[illegible]; SELEZNEV, A.G.; GERMAN, S.I.

Nature of the white streak in welds. Metalloved. i term.obr.met. no.1:46-47 Ja '65. (MIRA 18:3)

1. Khar'kovskiy politekhnicheskiy institut i Khar'kovskiy turbinnyy zavod.

L 34083-65 EPA(s)-2/EWP(k)/EWA(c)/EWT(m)/EWP(b)/T/EWP(v)/EWP(t) Pf-4 JD/HM

ACCESSION NR: AP5007337 S/0135/65/000/003/0013/0014

AUTHOR: Fomina, O. P. (Engineer); Gavranek, V. V. (Candidate of technical sciences); D'yachenko, S. S. (Candidate of technical sciences); Seleznev, A. G. (Candidate of technical sciences); German, S. I. (Candidate of technical sciences)

TITLE: Simulating the white stripe in welded joints

SOURCE: Svarochnoye proizvodstvo, no. 3, 1965, 13-14

TOPIC TAGS: steel welding, weld seam strength, white stripe, perlitic steel, carbon steel, alloy steel, thermal degradation, gradient heating

ABSTRACT: The authors note that a white stripe is observed in the heating zone during the macro-etching of welded joint templates of perlite steels and that, according to earlier investigations, this stripe is located in a zone corresponding to heating of the base metal to intercritical temperatures. The need for study in this area is noted and it is pointed out that simulation is the sole feasible method for such research. In this article, therefore, the problem of simulating the white stripe in welded joints is considered. In this connection, the authors propose that a well known method be used, for the purpose of simulation, involving the gradient heating of wedge-shaped samples. In the tests described in the paper, rectangular samples of different carbon and alloy steels (measuring 10 x 10 x 25

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and 20 x 20 x 50 mm) were flashed off, as well as round samples, 18 mm in diameter and 50 mm long. Depending on the size of the samples, the rate of heating in the upper range of the temperatures tested varied from 10 to 20 degrees/second. After flash-off, the samples were cooled at a rate of 70 degrees/second (in water), 8-13 degrees/second (in air) and 5-6 degrees/second (in sand heated to 400 C), thus permitting the study of the processes in the formation of those structures, different in character, which take place in the white stripe of real welded joints under different types and conditions of welding. The authors emphasize that the method described in this paper permits the study of mechanical properties only as a function of structure. On the other hand, in actual welded joints, these properties may change somewhat due to the field of stresses which develop during welding. However, such variations will inevitably be of only a quantitative, and not a qualitative, nature. In this way, the simulation methods proposed in this article (that is, the "gradient heating method" or the method involving the machining of separate samples from the intercritical temperature interval) are convenient for the study of the structural formation processes and for determining a complete set of mechanical properties of the white stripe. Specifically, the most suitable method of gradient heating is found to be the electric heating of wedge-shaped samples. The considerable width of the white stripe in this case and

L 34083-65

ACCESSION NR: AP5007337

2

the possibility of varying the cooling rate recommend this technique not only for a detailed study of hardness distribution, but also for the investigation of subtle and fine structural changes in the white stripe itself. Orig. art. has: 4 figures.

ASSOCIATION: KhPI im. V. I. Lenina; KhTGZ im. S. M. Kirova

SUBMITTED: 00 ENCL: 00 SUB CODE: MM

NO REF SOV: 004 OTHER: 000

Card 3/3

L 16749-66 EWT(d)/EWT(l)/EWT(m)/EWP(c)/EWA(d)/EWP(v)/T/EWP(t)/EWP(k)/EWP(l)/EWA(h)/ETC
ACC NR: AP6004127 IJP(c) JD SOURCE CODE: UR/0420/65/000/001/0063/0069

AUTHORS: Gavranek, V. V.; Fedorova, L. R.

ORG: Kharkov Aviation Institute (Khar'kovskiy aviatsionnyy institut)

TITLE: Determining grain size and orientation in drop-forged products

SOURCE: Kharkov. Aviatsionnyy institut. Samoletostroyeniye i tekhnika vozdushnogo flota, no. 1, 1965, 63-69

TOPIC TAGS: grain size, grain structure, ultrasonic inspection, steel, alloy, nondestructive test / D16 alloy

ABSTRACT: A method of nondestructive inspection of the structure of products by the increased-power ultrasonic method is proposed. The method permits visual observation of changes in the attenuation factor as well as recording of the results of monitoring on a photographic plate. Apparatus for the method is described (see Fig. 1). The frequency intervals of ultrasonic oscillations in which (with a small frequency drift) the attenuation factor changes at a maximum rate were established experimentally. Ultrasonic photographs were taken at 2.8 and 2.9 Mc. The accuracy of the method in determining grain size is 1—2 points

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L 16749-66

ACC NR: AP6004127

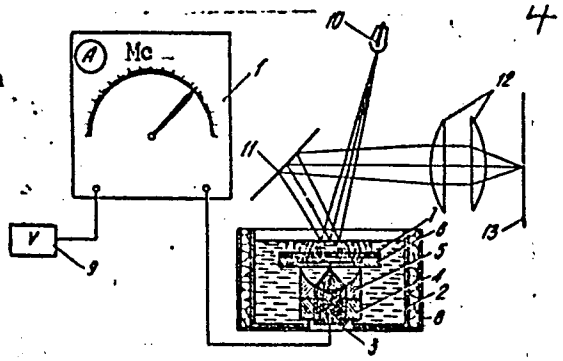

Fig. 1. Apparatus for determining grain size and orientation in metal of finished products: 1 - r-f oscillator; 2 - tank; 3 - radiator; 4 - part being checked; 5 - lens; 6 - diaphragm; 7 - photoplate; 8 - cooling jacket with ice; 9 - voltmeter; 10 - point light source; 11 - mirror; 12 - objective; 13 - screen.

on the grain-size scale. Specimens of D16 Duraluminum were studied (see Fig. 2).

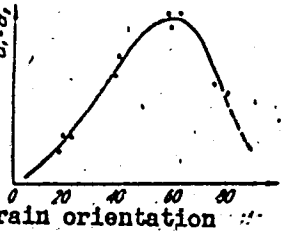

Fig. 2. Graph of difference between ultrasound attenuation factors along and across grain vs degree of grain orientation of structure.

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L 16749-66
ACC NR: AP6004127

In the presence of grain in a metal, the attenuation factor of ultrasound decreases and takes on an anisotropic nature along and across the grain. Orig. art. has: 1 diagram, 1 graph, 1 table, and 2 photographs.

SUB CODE: /3 SUBM DATE: none/ ORIG REF: 003/ OTH REF: 001

aluminum
21

Card 3/3 vmb

ACC NR: AR6029513 SOURCE CODE: UR/0137/66/000/006/I084/I084

AUTHOR: Gavranek, V. V.; Fedorova, L. R.

TITLE: A study of the effect of alloy structure on the damping of ultrasonic oscillations

SOURCE: Ref. zh. Metallurgiya, Abs. 6I591

REF SOURCE: Vestn. Khar'kovsk. politekhn. in-ta, no. 5(53), 1965, 20-26

TOPIC TAGS: ultrasonic property, pearlite steel, martensite steel, austenite steel / ST3 steel, KhVG steel, ST20 steel, U8 steel, U12 steel, EI256 steel, EI612 steel

TRANSLATION: A new method is proposed for studying metallic structures by means of ultrasonic oscillations, using oscillations with a final amplitude of about 10^{-8}-10^{-4} mm. Thereby, the possibility of measuring the amplitude dependence of damping (γ) was allowed, as well as of analyzing the localized structure in small volumes. The grain size dependence of γ was studied for pearlitic, martensitic and austenitic grades of steel: ST3, ST20, U8, U12, KhVG, EI256, EI612, as well as armco iron (ferritic structure). All steels had regions of maximal γ growth rate, corresponding to the relation $\lambda = 15\,\overline{D}$, where λ is the wavelength and $\overline{D}$ is the average grain diameter; this relationship was the same for all of the steels. On samples of duraluminum D16, the nature of the γ change was studied as a function of the increase in the percentage of

UDC: 669.017.620.1:539.67

Card 1/2

ACC NR: AR6029513

texture: γ decreased with an increase in texture and acquired an anisotropy in the directions parallel and perpendicular to the texture axis.

SUB CODE: 11,13

Card 2/2

ACC NR: AR6035112 (N) SOURCE CODE: UR/0137/66/000/008/I059/I059

AUTHOR: Seleznev, A. G.; Gavranek, V. V.; Shumakov, Yu. I.

TITLE: Hydroabrasive resistence of transition grade 10Kh15N4G4D2L stainless steel

SOURCE: Ref. zh. Metallurgiya, Abs. 8I402

REF SOURCE: Sb. Kavitats. i gidroabrazivn. stoykost' met. v gidroturbinakh. M., Mashinostroyeniye, 1965, 111-114

TOPIC TAGS: steel, stainless steel, high temperature steel, martensite steel, abrasive, abrasion resistant steel/10Kh15N4G4D2L stainless steel

ABSTRACT: The steel under investigation was of the following composition (in %): C, 0.07; Cr, 15; Ni, 4.2; Mn, 4; Cu, 2; W, 0.3. In cast state H_B = 163 and there is no ferrite in the structure. The machining conditions rate for 10Kh15N4G4D2L steel were established: normalizing after casting is made at 900—950C (for producing the maximum amount of martensite); high temperature tempering, at 700C with subsequent aging at 450C for 1.5—2 hours (σ_t , 96.0

Card 1/2 UDC: 669.15.018.8

ACC NR: AR6035112

kg/mm^2; σ_t, 59.4 kg/mm^2; δ, 26%; ψ, 45%; a_k, 9.3 kgm/cm^2); the other variant calls for sub-zero treatment after normalizing and subsequent aging at 450C for 2 hours (σ_t, 107 kg/mm^2; σ_t, 82.1 kg/mm^2; δ, 12.4%; ψ, 29.2%; a_k 9.1 kgm/cm^2). The hydroabrasive stability of the steel is higher after sub-zero treatment than with high-temperature tempering. Good wear resistant steel can be produced even at 340 H_B exceeding the wear resistance of 1Kh18Kh9T and 1Kh18N3G3D2L steels. V. Olenicheva. [Translation of abstract]

[AM]

SUB CODE: 13/

Card 2/2

ACC NR: AP7004187 (N) SOURCE CODE: UR/0369/66/002/006/0686/0688

AUTHOR: Gavranek, V. V.; Omel'chenko, V. S.

ORG: Khar'kov Polytechnic Institute im. V. I. Lenin (Khar'kovskiy politekhnicheskiy institut)

TITLE: Effect of deformation and subsequent near-recrystallization annealing on the cavitation resistance of 1Kh18N9T steel

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 6, 1966, 686-688

TOPIC TAGS: NICKEL STEEL, chromium ~~nickel~~ steel, ~~steel~~ cavitation ~~resistance~~, METAL deformation, wear resistant metal, steel structure, metal recrystallization, annealing, tensile strength, yield strength, elongation / 1Kh18N9T steel

ABSTRACT: Specimens of 1Kh18N9T [AISI 321] steel, 35 mm in diameter and 55 mm long, annealed at 1080°C and water quenched, were subjected to cold and warm (at 650 to 400°C) deformation with a reduction of 40—80%, annealed at 650—400°C for 2 hr, and tested for mechanical properties and wear resistance under cavitation conditions. The cavitation resistance of cold-deformed steel (measured by the weight loss of the specimens in 3-hr test) was found to increase continuously, but nonuniformly, with increasing reduction. The highest rate of increase was in the 50—80% range of reduction. Annealing at below-recrystallization temperatures promoted further increases in the cavitation resistance of cold-deformed steel. After a cold reduction of 80% and subsequent annealing at 550°C, the weight losses of 1Kh18N9T steel decreased by more than 300 and 150% compared with the losses of quenched and unannealed

Card 1/2 UDC: none

ACC NR: AP7004187

cold-deformed steel, respectively. Steel annealed at below-recrystallization temperatures and deformed in the 650—400°C range with a reduction of 80% had a tensile strength 112 kg/mm^2, a yield strength of 108 kg/mm^2, an elongation of 6%, a reduction of area of 45%, an impact toughness of 5.5 kg·m/cm^2, and a weight loss of 21 mg. The corresponding figures after annealing at 550°C for 2 hr were: 120 kg/mm^2, 117 kg/mm^2, 8%, 45%, 6.8 kg·m/cm^2 and 15 mg. It is believed that the higher strength and cavitation resistance of deformed 1Kh18N9T steel can be attributed to the structural changes caused by annealing at below-recrystallization temperature, which are associated with the redistribution of dislocations and with diffusion processes resulting in the formation of various segregations. Orig. art. has: 2 figures and 2 tables. [MS]

SUB CODE: 11, 13/ SUBM DATE: 14Dec65/ ORIG REF: 003/

Card 2/2

ACC NR: AP7004188 SOURCE CODE: UR/0369/66/002/006/0689/0692

AUTHOR: Gavranek, V. V.; Veselyanskiy, Yu. S.; Omel'chenko, V. S.

ORG: Khar'kov Polytechnic Institute im. V. I. Lenin (Khar'kovskiy politekhnicheskiy institut)

TITLE: Electronmicroscopic examination of 1Kh18N9T steel as a function of its condition and time of exposure to cavitation

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 6, 1966, 689-692

TOPIC TAGS: STEEL, cavitation, electron microscope, metal heat treatment, metal deformation/ 1Kh18N9T steel, UEMB-100 electron microscope

ABSTRACT: It has been observed (Gavranek, V. V., et al., same issue, p 686) that cold deformation (degree of deformation 80%) of 1Kh18N9T steel combined with its pre-recrystallization annealing quadruples its cavitation resistance (compared with austenitic state). In this connection, using an UEMB-100 electron microscope, the authors investigate the pattern of variation in the microrelief of 1Kh18N9T steel as a function of its heat treatment (quenching from 1080°C; quenching + 80% cold deformation at room temperature; quenching + 80% cold deformation + pre-recrystallization annealing at 550°C for 2 hr) and time of its exposure to cavitation (5, 30, 60 and 180 min) simulated with the aid of a magnetostriction vibrator (vibration amplitude 0.05,

Card 1/2

ACC NR: AP7004188

frequency 7500 cps). Findings: for the quenched specimens subjected to cavitation for 5 and 30 min the degree of differentiation of relief monotonically increases from the periphery to the center ; the same pattern is observed for the specimens subjected to both quenching and cold deformation, but only after 30 min of cavitation. For the specimens that also were annealed, on the other hand, the degree of relief differentiation reaches its peak only after 60 minutes of cavitation and they begin to display fragmentation following the first 5 and 30 minutes, and hence they are more resistant to erosive fracture during cavitation. Orig. art. has: 3 tables.

SUB CODE: 13, 11, 20/ SUBM DATE: 12May66/ ORIG REF: 005

Card 2/2

ACC NR: AP7005398 (A,N) SOURCE CODE: UR/0148/67/000/001/0146/0148

AUTHOR: Gavranek, V. V.; Omel'chenko, V. S.

ORG: Khar'kov Polytechnic Institute (Khar'kovskiy politekhnicheskiy institut)

TITLE: Effect of annealing at below recrystallization temperatures on the structure and mechanical properties of cold deformed 1Kh18N9T steel

SOURCE: IVUZ. Chernaya metallurgiya, no. 1, 1967, 146-148

TOPIC TAGS: chromium ~~nickel~~ steel, austenitic steel, ~~cold-deformed steel~~, ~~temperature~~ annealing, steel structure, solid mechanical property, recrystallization temperature, ductility, impact strength, metal deformation, nickel containing steel/ 1Kh18N9T steel

ABSTRACT: The mechanical properties and structure of hot-rolled 1Kh18N9T[AISI 321] steel containing (%): 0.12 C, 17.6 Cr, 10.60 Ni, 0.57 Ti, 0.67 Si, and 1.30 Mn, cold-deformed with compression and a reduction of up to 80% at a rate of 2—8 mm/min, and then annealed at temperatures up to 800°C, have been investigated. At 40% reduction the steel had one hardness maximum after annealing at 400°C, while steel at 50—80% reduction had two hardness maxima: the first after annealing at 400°C and the second after annealing in the 550—600°C range. Steel strengthening resulting from annealing at 400°C was accompanied by a decrease in ductility explained by aging with deformation. Annealing at temperatures up to 550 brought about further increases in all mechanical characteristics including ductility and impact toughness. With annealing at 550°C, the tensile strength of 1Kh18N9T steel, cold-deformed with 80% reduction, increased from 158 to 166 kg/mm^2, the yield strength from 156 to 164 kg/mm^2, the

Card 1/2 UDC: 669.26'24'295-12:621.785.3:620.17

ACC NR: AP7005398

reduction of area from 33 to 40%, the elongation from 4 to 7% and the impact toughness from 2 to 2.6 kg·m/cm^2. Warm-deformed (at 650—550°C) steel had a lower strength and higher ductility than cold-deformed steel, but subsequent annealing at 550°C also increased all the mechanical characteristics of the warm-deformed steel, although the amount of the α-phase did not exceed 1.0%. Thus, the strengthening of deformed 1Kh18N9T steel resulting from annealing at below-recrystallization temperatures (500—750°C) is not associated with martensitic transformation, but appears to be caused by structural changes which occur in the low-temperature annealing process, e.g., redistribution of dislocations, formation of various segregations, and restoration of the near and local far order. Orig. art. has: 3 figures and 1 table.

[MS]

SUB CODE: 11/ SUBM DATE: 29Mar66/ ORIG REF: 008/

Card 2/2

GAVRANIC, M.

GAVRANIC, M. The pressing of lees by hydraulic presses. p. 20.

Vol. 4, No. 5, May 1956.
POLJOPRIVREDA
AGRICULTURE
Beograd, Yugoslavia

So: East European Accession, Vol. 6, No. 2, February 1957

GAVRANKAPETANOVIC, M.

Protecting roads against snow and ice. p. 23.

Periodical: CESTE I MOSTOVI.

Vol. 7, no. 1, Jan. 1959.

TECHNOLOGY

SO: Monthly List of East European Accessions (EEAI) LC

Vol. 8, No. 4
April 1959, Uncl.

GAVRANKAPETANOVIC, Zijo

MIRIC, Vera, major, dr.; GAVRANKAPETANOVIC, Zijo, major, dr.

Case of Brill's disease. Voj. san. pregl., Beogr. 11 no.3-4:109-110 Mar-Apr 54.

1. Interno odeljenje Vojne bolnice u Sarajevu.
(TYPHUS
*Brill's dis.)

YUGOSLAVIA/Diseases of Farm Animals - Diseases Caused by Helminths. R-3

Abs Jour : Ref Zhur - Biol., No 11, 1958, 50228

Author : Boko, F., Beljin, V., Gavranovic, I.
Inst : -
Title : The Speed of Growth of Echinococcus Cysts in the Liver of Pigs.

Orig Pub : Veterinaria (Jugosl.), 1957, 6, No 2-3, 446-448

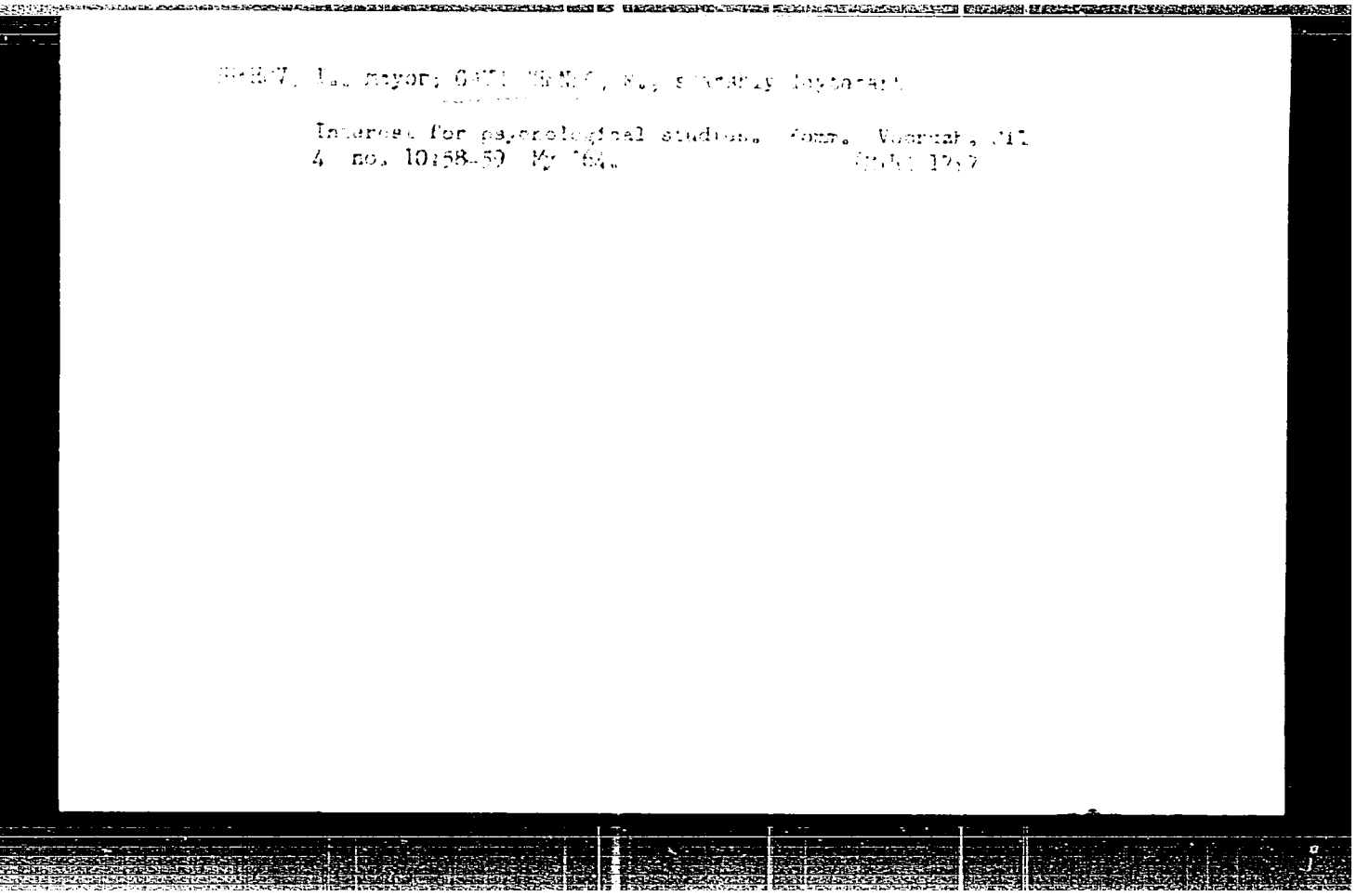
Abstract : Multiple liver echinococcosis was observed in a 13 months old pig. The liver was enlarged by 5-6 times and weighed 20 kg. A very large number of echinococcus cysts was found in the liver (some of them were the size of a child's head). The author is of the opinion that such rapid growth of echinococci is determined by the specific chemical composition of the liver, and by the immunobiological properties of the organism of pigs. -- A.N. Ivanov.

Card 1/1

GAVRASH, M.

Our grain procurement station will do away with lagging by opening up and using reserves. Muk.-elev.prom. 25 no.6:7-8 Je '59. (MIRA 12:9)

1. Direktor Sorokinskogo khlebopriyemnogo punkta Krasnoyarskogo kraya.
(Sorokino(Krasnodar Territory)--Grain elevators)



GAVRENKO, B.

Pioneers' radio receiver and transmitter. IUn. tekh. 7 no.10: 10-11 O '62. (MIRA 15:10)

1. Nachal'nik radiokluba Vsesoyuznogo pionerskogo lagerya "Artek".

(Amateur radio stations)
(Pioneers(Communist youth))

ROZENBERG, Vsevolod Aleksandrovich; POPOV, Nikolay Aleksandrovich; GAVRENKOV, I.T., red.; GUMBINA, S.V., tekhn.red.

[Reforestation of unforested areas of the Maritime Territory] Vosstanovlenie lesov v bezlesnykh raionakh Primor'ia. Vladivostok, Primorskoe knizhnoe izd-vo, 1960. 13 p.

(MIRA 13:10)

(Maritime Territory--Reforestation)

GAVRIC, D.

YUGOSLAVIA/Human and Animal Physiology. Internal Secretions. T

Abs Jour: Ref Zhur-Biol., No 8, 1958, 36634.

Author : Alegzetti, N., Fistor, V., Gavric, D.
Inst :
Title : The Origin of Antidiuretic Factors in the Serum of Rats.

Orig Pub: Glasnik biol. sek. Hrvatsko. prirodosl. drustvo. 1953 (1955) ser 2b, 7, 92.

Abstract: No abstract.

Card : 1/1

MOROZOV, A.A.; DRANITSKAYA, R.M.; GAVRILICHENKO, A.

Studies in the field of complex chromium sulfates. Nauch. ezhegod. Khim. fak. Od. un. no.2:65-[illegible] '61. (MIRA 17:8)

MOROZOV, A.A.; GAVRIL'CHENKO, A.I.; SEMCHISHIN, V.S.

Surface compounds of iron thiocyanate on ion exchangers.
Nauch. ezhegod. Khim. fak. Od. un. no.2:78-82 '61.
(MIRA 17:8)

Gavrichenkov, A. I. Aug 53

USSR/Medicine, Veterinary - Aujeszky's Disease

"The Clinical Aspects and Course of Aujeszky's Disease in Chickens," A. I. Gavrichenkov, Cand Vet Sci, Byelorussian Sci-Res Vet Exptl Sta (NIVOS)

Veterinariya, Vol 30, No 8, pp 29-30

Exptl infection established that chickens are susceptible to Aujeszky's disease. For intracerebral inoculation, virus diluted 1:10 can be used. The incubation period was 6-12 days. The chickens could not be infected by administering the virus per os, subcutaneously, or intramuscularly.

265 T 42

GAVRICHENKOV, A.I., kandidat veterinarnykh nauk.

Listerellosis in swine. Veterinariia 32 no.11:34-35 N '55.
(MLRA 8:12)

1.Belorusskaya nauchno-issledovatel'skaya veterinarnaya opytnaya stantsiya.
(SWINE--DISEASES) (LISTERELLA)

USSR/Diseases of Farm Animals - Diseases Caused by Helminths. R.
Arachno-Entoms.

Abs Jour : Ref Zhur - Biol., No 6, 1958, 26353

Author : Gavrichenkov, A.I.

Inst : -

Title : Sheep Paralysis Caused by Acaridae /Ornithodorus laborensis/.

Orig Pub : Veterinariya, 1957, No 9, 70-71

Abstract : The pathogenic agent of this disease is Ornithodorus laborensis. The clinical symptoms of the disease are refusal of food, depression of skin reflexes, heart weakness, sometimes slobbering, conjunctivitis and keratitis, followed by parases and paralyses. In serious cases the animals die. In adult sheep the disease lasts 24 hours to two weeks, in young animals,

Card 1/2

GAVRICHENKOV, A. I., DOLMATOVICH, V. M., SHCHERBAKOV, A. F., GOLUBEV, I. YE., GRIGOR'YEV, I.F., KRAYNOVA, V. I.

"Hog immunisation against cholera by means of avirulent lapinised dry virus-vaccine out of strains avirulent dry vaccine."

Veterinariya, Vol. 37, No. 10, 1960, p. 29

Gavrichenkov - Cand. Vet. Sci - Belorussian NIVI

ARTOBOLEVSKIY, I.I., akademik, otv.red.; ARTOBOLEVSKIY, S.I., prof., doktor tekhn.nauk, red.; BARANOV, G.G., prof., doktor tekhn.nauk, red.; BESSONOV, A.P., kand.tekhn.nauk, red.; GAVRILENKO, V.A., prof., doktor tekhn.nauk, red.; KOBRINSKIY, A.Ye., doktor tekhn. nauk, red.; LEVITSKIY, N.I., prof., doktor tekhn.nauk, red.; RESHETOV, L.N., prof., doktor tekhn.nauk, red.; BYSTRITSKAYA, V.V., inzh., red.; MODEL', B.I., tekhn.red.

[The theory of automatic machines and the theory of pricision in the manufacture of machinery and instruments] Teoriia mashin avtomaticheskogo deistviia i teoriia tochnosti v mashinostroenii i priborostroenii; sbornik statei. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1960. 218 p. (MIRA 13:7)

1. Vsesoyuznoye soveshchaniye po osnovnym problemam teorii mashin i mekhanizmov. 2d, Moscow, 1958.
(Machinery, Automatic) (Machinery industry)
(Instrument manufacture)

GAVRICHENKOV, A. I., (Candidate of Veterinary Sciences)

Cattle parasitism with leeches Limnatis nilotics and means of their control

Veterinariya vol. 38, no. 9, September 1961, pp. 46.

GAVRICHENKOV, A.I., kand. veter. nauk

The leech Limnatus nilotica parasitizing on animals and measures for its control. Veterinariia 38 no.9:46-47 S '61. (MIRA 16:8)

GAVRICHENKOV, A.I., kand. veter. nauk; KOROLEV, S.V.

Veterinary hygienic measures as a basis for the elimination of infectious atrophic rhinitis in swine. Veterinariia 42 no.7:14-15 Jl '65. (MIRA 18:9)

1. Belorusskiy nauchno-issledovatel'skiy veterinarnyy institut (for Gavrichenkov). 2. Glavnyy veterinarnyy vrach sovkhoza "Kurgany" Minskoy oblasti (for Korolev).

38122. GAVRICHENKOV, D.

Novoye v razvittii mukomol'no-krupyanoy promyshlennosti. Zagotovki s.-kh. produktov, 1949, No 2, s. 45-48

GAVRICHENKOV, D.N., inshener, laureat Stalinskoy premii; KUPRITSA, Ya.N., doktor tekhnicheskikh nauk, professor, redaktor; OKL'MAN, D.Ya, redaktor; LABUS, G.A., tekhredaktor.

[Utilization of the productive capacities of the flour and meal industry] Ispol'zovanie proizvodstvennykh moshchnostei mukomol'no-krupianoi promyshlennosti. Moskva, Gos. izd-vo tekhn. i ekon. lit-ry po voprosam zagotovok, 1953. 78 p.
(Grain milling) (MLRA 7:7)

GAVRICHENKOV, D.

Determining the productive capacity of grain mills. Muk.-elev. prom. 21 no.10:16-19 O '55. (MLRA 9:1)

1.Moskovskiy tekhnologicheskiy institut pishchevoy promyshlennosti.
(Grain milling)

GAVRICHENKOV, D.

Potentialities for increasing the work period of grain milling enterprises. Muk.-elev.prom. 22 no.1:12-14 Ja '56. (MLRA 9:5)

1. Moskovskiy tekhnologicheskiy institut pishchevoy promyshlennosti.
(Grain milling)

BOBROV, A.; GAVRICHENKOV, D.

Tasks of the flour milling, groats and mixed feed industry in the sixth five-year plan. Muk.-elev.prom. 22 no.3:3-5 Mr '56. (MLRA 9:7)

1.Nachal'nik Glavnogo upravleniya mukomol'noy, krupyanoy i kombikormovoy promyshlennosti (for Bobrov).2.Dotsent Moskovskogo tekhnologicheskogo instituta pishchevoy promyshlennosti (for Gavrichenkov).
(Grain milling)

GAVRICHENKOV

GAVRICHENKOV, D.N., dots., kand. ekon. nauk.

Development of the flour and groats industry. Trudy MTIPP no.7: 21-45 '57. (MIRA 10:12)
(Grain milling)

GAVRICHENKOV

GAVRICHENKOV, D.N., dots., kand. ekon. nauk.

Production process at flour and groats mills. Trudy MTIPP no.9:5-9 '57. (MIRA 10:12)

(Grain milling)

1

GAVRICHENKOV, D., kandidat ekonomicheskikh nauk.

Production planning and the selection of economically efficient millings in flour mills. Muk.-elev. prom. 23 no.6:18-21 Je '57. (MLRA 10:9)

1. Moskovskiy tekhnologicheskiy institut pishchevoy promyshlennosti.
(Grain milling)

GAVRICHENKOV, D.M.

[Economics, organization, and planning of flour and groat milling] Ekonomika, organizatsiia i planirovanie mukomol'no-krupianogo proizvodstva. Moskva, Khleboizdat, 1957. 358 p. (MIRA 11:5)
(Grain milling)

GAVRICHENKOV, Dmitriy Nikolayevich, dotsent, kand.ekon.nauk; YEFREMOV, I.I., spetsred.; GEL'MAN, D.Ya., red.izd-va; SAVEL'YEVA, Z.A., tekhred.

[Cost and ways of reducint it in flour, groat and feed milling] Sebestoimost' i puti ee snizheniia na predpriiatiiakh mukomol'noi, krupianoi i kombikormovoi promyshlennosti. Moskva, Izd-vo tekhn.i ekon.lit-ry po voprosam mukomol'no-krupianoi, kombikormovoi promyshl. i elevatorno-skladskogo khoz., 1958. (MIRA 12:3)
131 p.
(Grain milling--Cost)

GAVRICHENKO, D., kand.ekon.nauk

Determining production norms of flour and groat milling machinery. Muk.-elev.prom.24 no.2:14-16 F '58. (MIRA 11:4)

1. Moskovskiy tekhnologicheskiy institut pishchevoy promyshlennosti.
(Grain milling--Production standards)

GAVRICHENKOV, D., kand.ekonomicheskikh nauk

Principal factors of organizing, planning, controlling, and analyzing the production and administration of flour, groat, and feed mills. Muk.-elev.prom. 26 no.2:19-21 F '60. (MIRA 13:6)

1. Moskovskiy tekhnologicheskiy institut pishchevoy promyshlennosti.
(Grain milling)

GAVRICHENKOV, D., kand.ekonom.nauk

Planning the number of workers for flour and feed mills in connection with the change-over to the 7-hour workday. Muk.-elev. prom. 26 no.6:24-26 Je '60. (MIRA 13:12)

1. Moskovskiy tekhnologicheskiy institut pishchevoy promyshlennosti.
(Flour mills) (Feed mills)

GAVRICHENKOV, D., kand, ekonom.nauk

Ways for improving the planning at grain-milling enterprises.
Muk.-elev. prom. 27 no.7:23-24 Jl '61. (MIRA 14:7)

1. Moskovskiy tekhnologicheskiy institut pishchevoy promyshlennosti.
(Grain milling)

GAVRICHENKOV, D., kand.ekonomicheskikh nauk

New technological, industrial, and financial plan for grain milling groats, and mixed fodder enterprises. Muk.-elev.prom. 28 no.3:3-4 Mr '62. (MIRA 15:4)

1. Moskovskiy tekhnologicheskiy institut pishchevoy promyshlennosti.
(Grain handling)

GAVRICHENKOV, D.N.

Present state of the flour milling industry in the U.S.S.R. and ways of its development. Izv.vys.ucheb.zav.; pishch.tekh. 2: 3-6 '62. (MIRA 15:5)

1. Moskovskiy tekhnologicheskiy institut pishchevoy promyshlennosti kafedra organizatsii i planirovaniya proizvodstva.
(Flour and feed trade)

GAVRICHENKOV, D., kand.ekonom.nauk

Improve the organization of the management of flour milling enterprises. Muk.-elev.prom. 29 no.1:7-9 Ja '63. (MIRA 16:4)

1. Moskovskiy tekhnologicheskiy institut pishchevoy promyshlennosti.

(Flour mills—Management)

GAVRICHENKOV, D., kand.ekonom.nauk

Possibilities of increasing labor productivity in the milling, groats, and mixed feed industries. Muk.-elev. prom. 29 no.6: 6-7 Je '63. (MIRA 16:7)

1. Moskovskiy tekhnologicheskiy institut pishchevoy promyshlennosti.
(Grain handling--Labor productivity)

GAVRICHENKOV, D., kand.ekonom.nauk

Determining the degree of load and level of the utilization of equipment by the enterprises of the flour-milling industry. Muk.-elev. prom. 29 no.12:13-14 D '63. (MIRA 17:3)

1. Moskovskiy tekhnologicheskiy institut pishchevoy promyshlennosti.

GAVRICHENKOV, D. N.

Determining efficiency in the utilization of grain in its processing. Izv. vys.ucheb.zav.; pishch.tekh, no. 2:7-9 '64. (MIRA17:5)

1. Moskovskiy tekhnolcgicheskiy institut pishchevoy promyshlennosti, kafedra organizatsii proizvodstva.

GAVRICHENKOV, D., kand.ekonom.nauk

Losses in the milling industry and ways for their elimination.
Muk.-elev.prom. 30 no.1:5-6 Ja '64. (MIRA 17:3)

1. Moskovskiy tekhnologicheskiy institut pishchevoy promyshlennosti.

LUK'YANOV, V.B.; GAVRICHEV, V.S.

Use of dispersion analysis for selecting the conditions for the determination of aliphatic alcohols and aldehydes by paper chromatography. Vest. Mosk. un. Ser. 2: Khim. 20 no.1: 25-30 Ja-F '65. (MIRA 18:3)

1. Kafedra radiokhimii Moskovskogo universiteta.

SHURAKOVSKIY, V., prepodavatel'; NAUMOV, N., inzh. po podgotovke kadrov; GAVRICHKOV, F.

Bibliography. Prof.-tekhn.obr. 19 no.11:29 N '62. (MIRA 16:2)

1. Trest "Promstroy", g. Lipetsk (for Naumov). 2. Nachal'nik uchebno-kursovogo kombinata tresta "Kadiyevugol'" (for Gavrichkov).
(Bibliography--Vocational education)

ZHELOBKO, A.B.; GAVRICHKOV, F.S.

Training of specialists in the coal industry. Ugol' 39 no.6: 55 Je '64. (MIRA 17:7)

1. [redacted] upravlyayushchego trestom Kadiyevugol' po kadram (for Zhelobko). 2. Nachal'nik uchebno-kursovogo kombinata tresta Kadiyevugol' (for Gavrichkov).

GAVRICHKOV, Fedor Stepanovich; SHILIN, Boris Alekseyevich; LYAKHOV, G.M., kand. tekhn. nauk, retsenzent; SMIRNOV, L.V., otv. red.

[Miner of horizontal and inclined workings] Prokhodchik gorizontal'nykh i naklonnykh gornykh vyrabotok. Moskva, Nedra, 1965. 235 p. (MIRA 18:7)

GAVRIISKI, V. St.

Visual field, coordination and industrial gymnastics. Fiziol. norm. pat. 10 no.5:461-469 S-O '64.

1. Institutul superior de cultura fizica "D. Dimitrov", Catedra de fiziologie si chimie, Sofia.

GAVRIK, N. T.

Demonstration of the daily rotation of the earth. Fiz. v shkole 12, no 3, 1952

CATEGORY : USSR
CARD 1/2 Forestry. FOREST CULTURES.

ABS. JOUR. Ref Zhur-Biologiya, No.1,1959, No. 1507

AUTHOR : Gavrik, O.Ya.
INST. : Ukrainian Agric. Acad.
TITLE : Growth of Tree Species in the Forest Belts of the "Pobeda" Kolkhoz, Pole-Vinkovskiy Rayon, Kirovogradskaya Oblast.

ORIG. PUB. : Sb. stud. nauchno-issl. raboty Ukr. s.-kh. akad., 1957, vyp. 3, 143-147
ABSTRACT : No abstract

CARD: 1/2

GAVRIK, P. A.

GAVRIK, P. A.: "Soil-ecological conditions in the regions of widespread endemic hematuria of cattle in the Transcarpathian Oblast, Ukrainian SSR." Min Higher Education Ukrainian SSR. Khar'kov Order of Labor Red Banner Agricultural Inst imeni V. V. Dokuchayev. Khar'kov, 1956
(Dissertation for the Degree of Candidate in Agricultural Sciences)

So: Knizhnaya Letopis', No 17, 1956

GAVRIK, T. I., Cand Med Sci -- (diss) "Treatment of gitoxinous chronic cardiovascular insufficiency." Khar'kov, 1960. 16 pp; (Khar'kov State Medical Inst); 200 copies; price not given; (KL, 17-60, 168)

GAVRIK, V. Ya

191T95

USSR/Mathematics - Probability Theory Sep/Oct 51

"A Device for Demonstrating the Probability Laws," V. Ya. Gavrik

"Uspekh Matemat Nauk" Vol VI, No 5 (45), pp 185-189

Describes device for illustrating 2-dimensional distribution of small marbles falling through a funnel-shaped column full of regularly disposed screens or pegs, in analogy with the usual Gaussian distribution (1-dimensional). Four figures show the construction and scheme of operation.

191T95

GAVRIK, V.Ya. (Taganrog).

Discussion on the curriculum in physics; the study of physics and war technology. Fiz.v shkole 7 no.3:26-27 '53. (MLRA 6:11)
(Physics--Study and teaching)

GAVRIK, V.Ya. (g.Riga)

Use of a spinthariscope for the observation of air ionization. Fiz.v shkole 15 no.3:49-50 My-Je '55. (MLRA 8:6)
(Ionization of gases) (Electroscope)

GAVRIK, V.Ya. (g. Riga)

Demonstrating the absorption of alpha rays by solids. Fiz. v shkole 16 no.2:58 Mr-Ap '56. (MLRA 9:6)
(Alpha rays)

GAVRIK, V.Ya.

Use of a pendulum filled with a liquid for demonstrating the earth's diurnal rotation. Usp. fiz. nauk 81 no.4:774-777 D '63.
(MIRA 17:1)

GAVRIKOV, A., mekhanik

How to repair the magneto of the ZID-4, 5 engine. Tekh.v sel'khoz. 21 no.8:84 Ag '61. (MIRA 14:7)

1. Yanaul'skoye otdeleniye "Sel'khoztekhniki", Bashkirskaya ASSR.
(Gas and oil engines—Ignition)

GAVRIKOV, A.N.

AID P - 714

Subject : USSR/Electricity

Card 1/1 Pub. 29 - 7/26

Authors : Dmitriyev, V. A., Eng. and Gavrikov, A. N., Eng.

Title : Automatic valve for elimination of condensate

Periodical : Energetik, 9, 14-15, S 1954

Abstract : The authors briefly describe their own arrangement. One diagram.

Institution : None

Submitted : No date

GAVRIKOV, F., polkovnik

Bazooka teams. Voen. znan. 36 no.1:26-27 Ja '60.
(MIRA 12:12)
(Rockets (Ordnance)) (Antitank guns)

GAVRIKOV, F., polkovnik

Flame throwers. Voen.znan. 36 no.4:25-26 Ap '60.
(MIRA 13:4)
(Flame throwers)

GAVRIKOV, F., polkovnik

The reader corrects the artist's errors. Voen. znan. 37 no. 1:33 Ja '61. (MIRA 14:1)
(Military art and science)

GAVRIKOV, F., polkovnik

Defensive operations by rifle units. Voen.vest. 41 no.10:103-107 O '61. (MIRA 15:2)
(Attack and defense (Military science))

GAVRIKOV, F., polkovnik

Combat operations in winter. Voen.zhur. 38 no.1:9-10 Ja '62.
(MIRA 15:2)
(Winter warfare)

GAVRIKOV, F., polkovnik

"One-hundred and eighty days in combat" by V.I. Chuikov.
Reviewed by F. Gavrikov. Voen.znan. 38 no.12:39 D '62.
(MIRA 15:12)

(World War, 1939-1945—Personal narratives)
(Chuikov, V.I.)

GAVRIKOV, Fedor Kuz'mich, polkovnik; KORZUN, Lev Ignat'yevich, polkovnik; DUKACHEV, M.P., polkovnik, red.

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Gavrikov, Fedor Kuz'mich (Colonel); Korzun, Lev Ignat'yevich (Colonel)

Motorized rifle company in combat (Motostrelkovaya rota v boyu) Moscow, Voyenizdat M-va obor. SSSR, 1965. 162 p. illus. 8500 copies printed.

TOPIC TAGS: military training, military operation, military action

PURPOSE AND COVERAGE: The book is intended for commanders of motorized rifle units (platoons and companies), for students attending higher military schools for commanders, and for reserve officers. The role and capabilities of a motorized rifle company in modern combat are considered. Duties and various activities of a commander conducting combat operations are outlined and demonstrated with specific examples. The actions of a reinforced company in a reconnaissance group, on the march, and in offensive and defensive combat are described. The authors express gratitude to Lt. Gen. A. A. Andrushchenko, Col. A. I. Serov, and Lt. Col. I. I. Trushkin for their assistance. The book has 20 figures.

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