[illegible] V. N

TOPIC TAGS: magnetization, Curie point, ferromagnetic, inpurity ferromagnetic, Green function, Heisenberg magnet point for a Heisenberg ferromagnet containing, at its lattice points, a small concentration of a diamagnetic impurity (the analysis is carried out in a [illegible]

SUBMITTED: 24Mar64 ENCL: 00

ILYUSHCHENKOV, M.A.; SAVITSKIY, K.V.; KASHCHEYEV, V.N.

Increasing the abrasive capacity of the corundum and carborundum grain by vacuum thermal treatment. Izv. vys. ucheb. zav.; fiz. 8 no.1:178-179 '65. (MIRA 18:3)

1. Sibirskiy fiziko-tekhnicheskiy institut imeni akademika Kuznetsova.

L 20398-66 T IJP(c)
ACC NR: AP5022466 SOURCE CODE: GE/0030/65/011/001/0371/0380

AUTHOR: Kashcheyev, V. N. 50 B

ORG: Institute of Physics, Academy of Sciences of the Latvian SSR, Riga (IFANL) 16

TITLE: Green's function method in the theory of ferromagnetism 21

SOURCE: Physica status solidi, v. 11, no. 1, 1965, 371-380

TOPIC TAGS: ferromagnetism, spin system, Green function, heat capacity

ABSTRACT: The limits of applicability are established for the different decoupling procedures in the Green's function equations of the spin system of an Heisenberg ferromagnet. Orig. art. has 51 formulas. [Based on author's abstract]

SUB CODE: 20/ SUBM DATE: 12May65/ ORIG REF: 012/ OTH REF: 025/

Card 1/1

ACC NR: AP6024850 SOURCE CODE: UR/0371/66/000/002/0022/0031

AUTHOR: Kashcheyev, V. N. -- Kascojevs, V.

ORG: Institute of Physics, AN LatSSR (Institut fiziki AN Latv. SSR)

TITLE: On information obtainable with the aid of critical magnetic neutron scattering

SOURCE: AN LatSSR. Izvestiya. Seriya fizicheskikh i tekhnicheskikh nauk, no. 2, 1966, 22-31

TOPIC TAGS: neutron, neutron scattering, neutron critical magnetic scattering, neutron scattering information

ABSTRACT: A review of literature beginning with the discovery of the critical magnetic neutron scattering effect in 1953 (by H. Palevsky and D. Hughes, Phys. Rev. 1953, 92, 202) and ending with some 1965 references, is presented with constructive critical comments of the author and his consideration on information obtainable by the method of critical magnetic neutron scattering. Comments are directed essentially upon problem elucidation and upon the devising of decisive experiments. Topics of information which could be gained from the critical magnetic scattering effect (e.g. information on the spin system of ferromagnetics) are discussed. A number of new experiments related to the effect are proposed. Author thanks B.V. Kuvaldin and Yu.V. Lipin for valuable comments.

SUB CODE: 20/ SUBM DATE: 22Apr65/ ORIG REF: 011/ OTH REF: 038

Card 1/1

Card 1/1 nst

KASHCHEYEV, V. N.

Kashcheyev, V. N. "The wear of steel under the friction of a smooth-cut file and determination of hardness by the scratch method as dependent on cold-working," Trudy Sib. fiz,-tekhn. in-ta, Issue 26, 1948, p. 25-31, - Bibliog: 5 items.

SO: U-5241, 17 December 1953, (Letopis 'Zhurnal 'nykh Statey, No. 26, 1949)

KASHCHEYEV, V.N.

Abrasive effect of "electrocorundum" and carbocorundum granules in using various grade adhesives. Podshipnik no.7:22-26 Jl '53. (MLRA 6:8)
(Abrasives)

KASHCHEYEV, V.N.

Preliminary cold hardening and abrasive destruction of a metallic surface. Sel'khozmashina no.1:31 Ja'55. (MIRA 8:3)
(Metals--Testing)

USSR/Physics - Abrasion FD - 3161

Card 1/1 Pub. 153 - 17/26

Author : Kashcheyev, V. N.

Title : Destruction of the surface of a metal as a function of the angle of shock of the abrasive particle

Periodical : Zhur. tekh. fiz., 25, No 13 (November), 1955, 2365-2368

Abstract : The process of abrasive destruction of a metal surface and the process of scratching are related in character (V. D. Kuznetsov, Fizika tverdogo tela [Physics of the solid body], Tomsk, 1947; Ye. N. Maslov, Osnovy teorii shlifovaniya metallov [Principles of the theory of polishing of metals], Moscow, 1951; V. N. Kashcheyev, ZhTF, 23, No 4, 1953). Rigidly held abrasive grain with a binder (circle, bar, etc.) acts upon the surface of the polished body most frequently by means of shocks, the normal component of the force of the shock against the body being relatively great especially in the presence of vibration and considerable heating of the axle. The author discusses his experiments showing that the abrasive capacity of grains depends upon the angles of the shock and also upon the plasticity of the standard. He makes the assumption that the position of maximum wear must depend upon the speed of shock since the metal will be more friable the higher this speed. In the experiments abrasive was allowed to fall through a funnel upon metal (Cu e.g.) held at various angles etc. Six references, all USSR.

Submitted : October 6, 1954

KASHCHEYEV, V. N.

"Nonlubricated Friction of Certain Metal Pairs" p. 86-93, in book Research X in the Physics of Solids, Moscow, Izd-vo AN SSSR, 1957. 277 p. Ed. Bol'shanina, M. A. Tomsk Universitet, Siberskiy fiziko-tekhnicheskiy, institut.

Personalities: Aynbinder, S. A.; Klokova, E. F., and Kostetskiy, B. I. Materials X tested: hardened steel ShKh 15, annealed medium-carbon steel, and bronze OTsS -6-6-3. There are 6 figures and 7 references, 5 of which areXXXXXX Soviet.

This collection of articles is meant for metallurgical physicists and for engineers of the metal-working industry. This book contains results of research in the fiedl of X failure and plastic deformation of materials, mainly of metals, Problems of cuting, abrasion, friction, and wear of solid materials. (metals) are discussed.

(3)

SOV/137-58-11-23467

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 11, p 232 (USSR)

AUTHORS: Kashcheyev, V. N., Kiselev, G. I., Polosatkin, G. D.

TITLE: Wear Resistance of Carbon Steels at Elevated Temperatures (Iznosostoykost' uglerodistykh staley pri povyshennykh temperaturakh)

PERIODICAL: Dokl. 7-y Nauchn. konferentsii, posvyashch. 40-letiyu Velikoy Oktyabr'skoy sots. revolyutsii. Nr 2. Tomsk, Tomskiy un-t, 1957, pp 49-50

ABSTRACT: Wear of steels containing various quantities of C (0.04, 0.23, 0.57, 0.68, and 1.04%) was investigated at temperatures of 20, 100, 200, 300, 400, and 500°C by the method of mutual grinding and by the method of wear in a stream of abrasive particles. The hardness of the steel was evaluated from the magnitude of an indentation produced by a cone-shaped penetrator (H_k) as well as from the results of scratching the specimen with the same penetrator (H_{ts}). It is demonstrated that as the concentration of C in the steel is increased the H_{ts} value increases throughout the

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SOV/137-58-11-23467

Wear Resistance of Carbon Steels at Elevated Temperatures (cont.)

entire range of temperatures (20-500°) concurrently with an increase in either the σ_b or the H_k. Depending on the C content, the wear resistance, which is determined by the method of mutual grinding, varies also in accordance with the variations in σ_b. A qualitative relationship between wear resistance and strength characteristics (σ_b, S_k, and A_k) is established: Minimum wear is observed in specimens possessing maximum strength. At elevated temperatures, the strengthening effect of the cementite is greater, in the case of steel 15KhM, than the effect produced by the addition of Cr and Mo.

I. B.

Card 2/2

SOV/137-59-1-1166

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 1, p 158 (USSR)

AUTHOR: Kashcheyev, V. N.

TITLE: On the Dry Friction of Some Metallic Pairs (K voprosu o sukhom trenii nekotorykh metallicheskikh par)

PERIODICAL: V sb.: Issled. po fiz. tverdogo tela. Moscow, AN SSSR, 1957, pp 86-93

ABSTRACT: The author studied the behavior of identical metals under conditions of dry friction (F), strong seizing, and a possible directional transfer of metal. The experiments were conducted on an apparatus which had a mandrel with a ring (R) of 40-mm diam set on it rotating at a constant rate (36 rpm). A second R of the same diam, set on a bracket and rotating at a different rate was pressed against the moving part of the apparatus. It was established that wear of R made of the same metal (hardened ShKh15 steel, medium-carbon annealed steel, and OTsS-6-6-3 bronze) depends to a great extent on their mutual sliding speed and that at a low speed the wear of the rapidly revolving R is greater than the wear of the one revolving slowly at a constant rate, whereas upon an increase of the sliding speed the ratio of wear is

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SOV/137-59-1-1166

On the Dry Friction of Some Metallic Pairs

reversed. At certain speeds of mutual sliding of the R's an appreciable directional transfer of metal, which is caused by the process of cold seizing, is possible. F of a pair of hardened ShKh15 steel R at a speed of 9.3 m/sec was accompanied by an insignificant decrease of the hardness of very thin surface layers. A bronze ring wears out faster than a steel R under F against an R of hardened steel, which fact is explained by the relatively unfavorable seizing occurring between dissimilar metals and the weak tendency of bronze towards frictional hardening.

A. N.

Card 2/2

PA - 3566

AUTHOR: KASHCHEYEV, V.N.

TITLE: Comparison of Mineral Grains Abrasic Properties by means of Mutual Grinding. (Sravneniye abrazivnykh svoystv mineral'nykh zeren po metodu vzaimnogo shlifovaniya, Russian)

PERIODICAL: Zhurnal Tekhn. Fiz., 1957, Vol 27, Nr 5, pp 1100 - 1105 (U.S.S.R.)

ABSTRACT: In order to check the papers by KUZNETSOV (Doklady Akademii Nauk SSSR, 1952, Vol 84, Nr 5 and Nr 6 as well as Zhurnal Tekhn. Fiz., 1952, Vol 22, Nr 9), the tests described here were carried out on an electrocorundum block with a microstrength of more than 2000 kg/mm^2, which was ground together with steel ShKh 15 which was hardened up to HR_C = 62. Silicon carbide, which is ground together with normal electrocorundum, has an 1.8 times greater resistance against wear if boron carbide powder is added. By grinding an Al-Cu-alloy (25% Cu) together with hardened ShKh 15 steel better cutting properties of the silicon carbide with respect to the alloy and better cutting properties of the electrocorundum with respect to the steel are found. Experiments carried out by grinding together in those cases in which destruction has a percussion-vibration character and forces that are vertical to the grinding surface predominated, showed the effect of the normal destructive stresses for brittle bodies. It was shown that by the grinding together of hardened steel and electrocorundum

Card 1/2

KASHCHEYEV, V.N.; TKACHENKO, N.Ya.

Friction of bronze against bronze at different speeds and loads. Izv. vys. ucheb. zav.; fiz. no.2:171-173 '58. (MIRA 11:6)

1.Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete im. V.V. Kuybysheva.
(Bronze--Testing) (Friction)

24(6), 18(7) SOV/139-59-1-9/34

AUTHORS: Kashcheyev V.N. and Voytsekhovskaya L.N.

TITLE: Abrasive Wear of Aluminium-Magnesium Alloys at Various Temperatures (Abrazivnyy iznos splavov alyuminiy-magniy pri razlichnykh temperaturakh)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika, 1959, Nr 1, pp 57-62 (USSR)

ABSTRACT: The abrasive wear and "hot" hardness of alloys of aluminium and magnesium of various concentrations has been investigated at various temperatures. Specimens, cast into a chill mould and subsequently annealed, were studied. They had the following concentrations: 0, 1, 4, 8, 16 and 20% by weight of technically pure magnesium, the remainder being technically pure aluminium. The following temperatures were selected for testing: 20, 100, 200, 300 and 400 °C. The face of a cylindrical specimen of 5 mm diameter, gripped in tongs, was rubbed against the flat surface of a slowly revolving electro-corundum disc of medium hardness and grain size, bonded with a ceramic material. The apparatus, described by Kiselev (Ref 7), enabled wear against a continuously changing portion of the disc, i.e. along a spiral path. The wearing specimen

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and the abrasive disc were situated inside an electric furnace. The temperature was measured by means of a thermocouple, the hot junction of which was placed close to the wearing specimen. The normal load on the specimen was always constant (3 kg). The amount of wear was estimated by weighing the specimens before and after the experiment with an accuracy of up to 0.1 mg. In Fig 1 the dependence of the total wear of alloys on their concentration at various temperatures is shown. In Fig 2 the dependence of total wear of the same alloys on the temperature of testing is shown. Fig 3 accommodates the left hand corner of the aluminium-magnesium equilibrium diagram, together with wear resistance curves for the alloys under investigation. The reciprocal of the total wear is taken as wear resistance. In Fig 4 the relationship between rubbing force and temperature for alloys of the concentrations investigated is shown. The hot hardness, which was tested by the same equipment at the above indicated temperatures, was taken as a characteristic of the mechanical properties of the alloys. The hardness was calculated by the formula:

$$H_k = \frac{P}{\frac{\pi d^2}{4}}$$

where P is the load in kg, d is the diameter of impression in mm. In Figs 5 and 6, the relationships between hot hardness and concentration of the alloys at various temperatures, and hot hardness and testing temperature for various concentrations, are shown. The wear by firmly gripped abrasive grains leads to local destruction of the metal by scratching, An effort has been made to find a relationship between the volume of metal removed from the surface and the extent of plastic deformation brought about by scratching, which is expressed by the so-called "piling-up" of metal. Specimens containing 0.8 and 16% Mg, were scratched at a load of 0.750 kg. Scratching was carried out at 20, 200 and 400°C at very low speed. In Fig 7, a typical cross-section of the metal surface, perpendicular to the scratch, is shown. If S_1 is the cross-sectional area of removed metal, and S_2 the cross-sectional area of piled-up metal, then

$$\eta = \frac{S_1}{S_1 - S_2}$$

will tend to unity when S_2 tends to zero. The more plastic the metal, the greater will be η . In Table 1 the test results are shown. As the temperature is raised, so η tends to increase. It appears that η is characteristic of the brittleness and plasticity of scratched metal. As a result of the above investigations the authors have arrived at the following conclusions:
(1) The abrasive wear of alloys at low temperatures is the lower, the greater the magnesium content of the alloy and the greater the static distortions at a constant bond force. This does not apply for high temperatures, as the melting point of the alloy and the degree to which it softens begin to exert a decisive influence.
(2) Between the wear resistance and hot hardness of the investigated alloys there is only a qualitative relationship, and that only at low temperatures of testing: the greater the hardness the greater the resistance to wear.
(3) The concentration of saturation of the solid solution

SOV/139-59-1-9/34

Abrasive Wear of Aluminium-Magnesium Alloys at Various Temperatures

by magnesium at various temperatures of testing does not exert any influence on the wear resistance curves of the alloys.

(4) The friction force does not to any extent characterise the resistance of alloys to abrasive wear.

There are 7 figures, 1 table and 7 Soviet references.

ASSOCIATION: Sibirskiy Fiziko-tekhnicheskiy institut pri Tomskom Gosuniversitete imeni V.V. Kuybysheva (Siberian Physico-Technical Institute at Tomsk State University, imeni V.V. Kuybyshev)

Card 5/5

SUBMITTED: July 4, 1958

SOV/143-59-3-17/20

18(7)

AUTHOR: Kashcheyev, V.N., Candidate of Physical-Mathematical Sciences

TITLE: The Problem of Metal Destruction in a Stream of Abrasive Particles (K voprosu o razrushenii metalla v potoke abrazivnykh chastits)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy - Energetika, 1959, Nr 3, pp 131-141 (USSR)

ABSTRACT: Ash erosion is one of the frequent causes of boiler failure. Therefore, the author describes a method for determining the abrasive properties of a loose abrasive material. He determines the wear resistance of steel using the rotating-ring method, as shown in figure 2. The test results are shown in three graphs, figures 6-8. The author points out that low-carbon steel, for example 15KhM, was less wear resistant to abrasive particles than steel with a carbon content of 1.04%. The favorable influence of carbon is felt especially at temperatures between 400-500°C, where steel with 0.04% carbon content showed a lesser wear resistance.

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SOV/143-59-3-17/20

The Problem of Metal Destruction in a Stream of Abrasive Particles

Further, the author established some relations between the wear resistance in a stream of abrasive particles and the mechanical characteristics. The greatest strength at 300°C corresponds to the highest wear resistance. The lowest strength at 500°C was connected with a low wear resistance at the same temperature. The oxidation process must have a great influence on the wear of carbon steel. Once, the strength properties of the oxide coating are different from the analoguous properties of steel and, in addition, the fastening of the oxide coating to the metal surface has a certain influence. There are 7 graphs, 1 diagram, 2 tables and 16 Soviet references.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut (Siberian Physical-Technical Institue) Laboratoriya rezaniya i treniya (Laboratory for Cutting and Friction)

SUBMITTED: July 21, 1958

Card 2/2

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000721010016-3"

68869

18.8200

S/139/59/000/05/010/026
E091/E191

AUTHOR: Kashcheyev, V.N.

TITLE: On the Dependence of Wear Resistance of a Metal in an Abrasive Stream on its Surface Hardness, Acquired by Mechanical Working

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1959, Nr 5, pp 58-63 (USSR)

ABSTRACT: In abrasive wear it is assumed that preliminary working does not affect wear resistance of metals. The surface of a ring made from cold-rolled commercially pure aluminium (65% deformation) was subjected to impact by abrasive particles, as shown in Fig 1. The linear peripheral velocity of the ring was 26 m/sec, and the grain sizes were 500 to 600 μ. The loss in weight of the ring in milligrams corresponding to the consumption of a definite portion of the grain was recorded. The ring was then annealed at 400 °C. If the hardness according to the Shore scale fell from 15 to 8 and the microhardness from 55 kg/mm2 to 31 kg/mm2, the wear was assumed not to have suffered any change. Rings of carbon steel containing 0.1% and 0.68% carbon, after machining with corundum on an abrasive cloth Nr 240 at

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APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000721010016-3"

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S/139/59/000/05/010/026
E091/E191

On the Dependence of Wear Resistance of a Metal in an Abrasive Stream on its Surface Hardness, Acquired by Mechanical Working

approximately 5 m/sec as the last operation, were tested for hardness with TP and PMTZ machines, and were subsequently subjected to wear in a stream of slowly falling abrasive electrocorundum of 500 to 600 μ grain size. 1000 g of grains were used in one experiment. The rate of revolution of the rings was 2990 r.p.m., their diameter was 120 mm, their width 15 mm, the height of fall of the grains 900 mm, the diameter of the abrasive stream 8 mm and the duration of the experiment approximately 50 minutes. The wear was determined by weighing on analytical balances to an accuracy of up to 0.1 mg. The surface of the above rings was subjected to rubbing against a medium carbon steel ring of 50 mm diameter and 2 mm width; the side-face edges of the ring became rounded. Rubbing was continued for several hours by rotating both rings in one direction, i.e. pure slip without free play took place. One of the rings was displaced along its axis which caused hardening along the whole surface. The speed of rubbing was approximately 5 m/sec and the compressive force on the rings was 2000 g.

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S/139/59/000/05/010/026
E091/E191

On the Dependence of Wear Resistance of a Metal in an Abrasive Stream on its Surface Hardness, Acquired by Mechanical Working

Ample machine oil was applied. As a result of friction, the microhardness of the rings increased considerably. Their further treatment in the abrasive stream by the previous method showed a distinct drop in wear. In Figs 2 and 3 curve 1 shows the summary wear of a low carbon steel which had not been submitted to metallic friction. The initial diamond-pyramid hardness at a load of 5 kgm was 143 kg/mm^2, the initial microhardness of the ring surface at a load of 50 g was 148 kg/mm^2. Curve 2 shows the summary wear of the same ring after its surface had hardened as a result of metallic friction, after which its hardness of 143 kg/mm^2 had not changed; the microhardness at a load of 50 g had increased to 588 kg/mm^2. Curve 3 shows the summary wear of a high carbon steel ring which had not been submitted to metallic friction. The initial hardness was 245 kg/mm^2 and the initial microhardness of the ring surface at a load of 50 g was 420 kg/mm^2. Curve 4 shows the summary wear of the same ring after its surface had rubbed against that of a medium carbon steel by the

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S/139/59/000/05/010/026
E091/E191

On the Dependence of Wear Resistance of a Metal in an Abrasive Stream on its Surface Hardness, Acquired by Mechanical Working

above method, which caused a small rise in hardness to 257 kg/mm^2 and a great increase in microhardness of the surface to 657 kg/mm^2. In connection with the above results the determination of the influence of preliminary working of the steel, by polishing on an abrasive cloth, on the wear resistance of the steel in an abrasive stream was of interest. An annealed medium carbon steel ring of 110 kg/mm^2 hardness was subjected to wear in a stream of OKS abrasive particles of 250 to 600 μ grain size. The test was carried out by the same method as shown in Fig 1 but with the difference that the grains were falling not along the tangent of the ring surface but at right angles to it. 1000 g of grains falling from a height of 46 cm was used for each test. The cross-section of the grain stream was 17 X 1.5 mm^2, the ring diameter 120 mm, its width 20 mm, the number of revolutions per minute 6000, and the duration of the test 13 to 14 minutes. The amount of wear was determined by weighing on analytical balances to an accuracy of up to 0.1 mg. The results of these tests are shown in Table 1.

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S/139/59/000/05/010/026
E091/E191

On the Dependence of Wear Resistance of a Metal in an Abrasive Stream on its Surface Hardness, Acquired by Mechanical Working

In order to find out whether phase transformations or the usual hardening due to plastic deformation affected the wear resistance to an abrasive stream, experiments were carried out in which the alloy D16 and commercially pure aluminium, copper and nickel were tested. Fig 4 shows the results of wear of a ring-shaped specimen of the Duralumin alloy D16. Fig 5 gives the results of wear, in an abrasive stream of OKS1 grains of approximately 500 µ diameter, of annealed and subsequently hardened (by rubbing against steel rollers) ring-shaped specimens of commercially pure aliminium, copper and nickel. An analysis of the above results leads to the conclusion that the increase in wear resistance in an abrasive stream, after hardening of the surface by friction, was brought about only for alloys which undergo phase transformations (steel and D16 alloy). In this case, as a result of friction (steel), a very great increase in hardness is observed. Friction of commercially pure aluminium, copper and nickel is not accompanied by a great rise in hardness and does not

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S/139/59/000/05/010/026
E091/E191

On the Dependence of Wear Resistance of a Metal in an Abrasive Stream on its Surface Hardness, Acquired by Mechanical Working

cause a change in their wear resistance to an abrasive stream. It appears that the main reason for the increase in wear resistance of surfaces subjected to friction is the formation of wear-resistance structures as a result of specific phase transformations which take place during friction.

Card 6/6

There are 5 figures, 1 table and 16 references, of which 11 are Soviet, 4 German and 1 English.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete imeni V.V. Kuybysheva (Siberian Physico-Technical Institute of the Tomsk State University imeni V.V. Kuybyshev)

SUBMITTED: January 20, 1959

KUZNETSOV, V.D.; KASHCHEYEV, V.N.

Hardness of metals and their wear in a stream of abrasive particles. Inzh.-fiz.zhur. no.10:93-96 0 '59.
(MIRA 13:2)

1. Sibirskiy fiziko-tekhnicheskiy institut, Tomsk.
(Hardness) (Mechanical wear)

69432

S/139/60/000/01/006/041
E073/E435

18.8200

AUTHOR: Kashcheyev, V.N.

TITLE: Wear of Aluminium-Magnesium and Aluminium-Zinc Alloys in a Stream of Abrasive Particles at Elevated Temperatures

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960, Nr 1, pp 38-45 (USSR)

ABSTRACT: The abrasive wear in a stream of corundum particles was investigated for Al-Mg and Al-Zn alloys containing respectively 0, 1, 4, 8, 16 and 20 wt % of pure magnesium and 0, 1, 2, 10, 20 and 35 wt % of pure zinc, rest pure aluminium. The experiments were made at various temperatures between 20 and 400°C. The rate of abrasive wear as a function of the magnesium and zinc content respectively is entered in the plots, Fig 1 and 2. Fig 3 shows a plot of the hot-hardness (at 20, 100, 200, 300, 400°C) as a function of the magnesium content (%); Fig 4 shows a similar plot for Al-Zn alloys. Fig 5 and 6 show respectively

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69432
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E073/E435

Wear of Aluminium-Magnesium and Aluminium-Zinc Alloys in a Stream of Abrasive Particles at Elevated Temperatures

the dependence of the abrasive wear of Al-Mg and Al-Zn alloys on the test temperature. Fig 7 and 8 show respectively plots of the dependence of the hot hardness of Al-Mg and Al-Zn alloys on the test temperature. The results indicate that static distortions in alloys which are caused by the presence of atoms of the alloying elements lead to an increase of the wear resistance at low temperatures, whilst at high temperatures the wear will usually increase the more intensively, the higher the degree of alloying. This behaviour is attributed to a drop in the fusion temperature with increasing content of the alloying element in the alloy. The hardness in the hot state does not determine unequivocally the wear resistance, although there is a qualitative correspondence between these characteristics within a certain range.. The concentration of the limit saturation solid solutions does not appear to be characterized by any specific

Card 2/3

69432
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E073/E435

Wear of Aluminium-Magnesium and Aluminium-Zinc Alloys in a Stream of Abrasive Particles at Elevated Temperatures

effect on the wear resistance. There are 8 figures, and 9 Soviet references.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete imeni V.V.Kuybysheva
(Siberian Physico-Technical Institute, Tomsk State University imeni V.V.Kuybyshev)

SUBMITTED: February 24, 1959

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Card 3/3

KASHCHEYEV, V.M.

Wear of duralumin from impacts by abrasive particles during aging. Izv.vys.ucheb.zav.;fiz. no.2:235-236 '60. (MIRA 13:8)

1. Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete im. V.V. Kuybysheva.

(Duralumin)

S/145/60/000/008/008/008
D211/D304

AUTHORS: Kashcheyev, V.N., Candidate of Physico-Mathematical Sciences, and Glazkov, V.M., Engineer

TITLE: Wear of metals in a stream of abrasive particles of various hardness

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Mashinostroyeniye, no. 8, 1960, 132 - 138

TEXT: The article deals with the resistance to war of commercially pure metals subjected to the impacts of abrasive particles of various hardness. The wear resistance of Pb, Bi, Sn, Sb, Al, Cd, Mg, Zn and steels C60H (S60N) and Cт37 (St37) were investigated using coal, slate, calcite, magnesite and OKC$_1$ (OKS$_1$) as the abrasive. The wear of these metals was a function of the hardness of the abrasive, the modulus of elasticity i.e. Young's modulus of the material, and also the coefficient of rigidity of the lattice K. The author states that the wear, expressed in mm^3, of metals of various hardness rises sharply if the hardness of the abrasive is compara-

Card 1/3
2

Moscow Mining-Tech. Inst.

21321

17.4410

S/143/60/000/012/005/007
A163/A026

AUTHORS: Kashcheyev, V. N., Candidate of Physical and Mathematical Sciences; Glazkov, V. M., Engineer

TITLE: Comparative resistance to wear of some metals in a flow of abrasive particles at increased temperatures

PERIODICAL: Energetika, no. 12, 1960, 74 - 77

TEXT: The article deals with the resistance to wear of some metals in a flow of abrasive particles at increased temperatures. The author furnishes data on experimental tests carried out with the following types of steel being used in engineering and boiler construction: 20-type steel subjected to thermal treatment by tempering on laminar and granular perlite; 15ХМ (15KhM), Э10 (E10), Г13 (G13), Х12 (Kh12), СХ8 (SKh8M) and 1Х18Н9Т (1Kh18N9T) steels; and ВК20 (VK20) hard alloy. The wearing tests were performed with the help of an installation shown on Figure 1. ОКС (OKS) grain, having a hardness of $N_{\text{п}} \simeq 2,100$ kg/mm^2 and a size of 500 - 600 mk, slowly and evenly reached the cylindrical surface of the disc via hopper (1), a

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special device (2), and a vertical tube (3). The steel disc (4) rotated at a speed of n = 3,500 revolutions per minute. The metals to be tested were fastened into wedge-shaped notches on the circumference of the disc. They had the form of laminae with a cylindrical working surface of 15 x 20 mm. The overall diameter of the disc was 120 mm and the linear speed of the disc rim points 22 m/sec. The disc was set up in an electric furnace (5) lined on the inside to keep the temperature on an even level. The escaping grain was recovered by container (6) and used again, since its abrasive power remained unchanged. The temperature was maintained with the help of ЛАТР (LATR) operating with an accuracy of ± 10°C and fixed with thermocouple (7). The 20-type steel on laminar perlite was tempered at 800°C for 30 minutes and subsequently cooled down at a rate of 15 - 20 degrees per hour by passing the critical points. The tempering on the globular perlite had been carried out at 770° C for minutes with subsequent cooling at a rate of 60-70 degrees per hour. In the course of each test, lasting for 180 - 190, 4 kg of grain was used. The wear of the inserts was determined with an analytical balance and by hydrostatical weighing. The VK20 alloy possesses the best wear-resisting properties, and the 20-type steel, tempered on globular per-

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S/143/60/000/012/005/007
A163/A026

Comparative resistance to wear of ....

lite, the lowest, according to the results obtained. It is interesting to note that, if the initial hardness of the VK20 alloy is about 10 times higher than that of the 20-type steel, the wear of the latter is greater by only 3.6 times at 500°C, and by 5 times at 20°C. In spite of the considerable mechanical differences between the materials selected, the wear of the metals in the abrasive flow did not make them so much different from one another. It may be assumed that the resistance to wear of the 1Kh18N9T, SKh8M and Kh12 steels, and that of the VK20 alloy, is mainly due to their low corrosion at 500°C. In fact, when rotating the disc with the metal pieces at an ambient air temperature of 500°C for 180 minutes without feeding of grains, the weight of the 20-type, 15KhM, E10, and G13 steels decreased by 0.1 - 4.2 mg, that of the Kh12 steel and Vk20 alloy increased by 0.4 - 1.1 mg, and the weight of the SKh8M and 1Kh18N9T steels remained unchanged. The author concludes by pointing out that the highly-manganous G13 steel did not reveal any high wear-resisting properties, although its hardness increased after tempering and cooling during test intervals, while that of other materials decreased. There are 4 figures and 6 Soviet references.

X

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21321
S/143/60/000/012/005/007
A163/A026

Comparative resistance to wear of ....

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy nauchno-issledovatel'skiy institut pri Tomskom gosudarstvennom universitete imeni V.V.Kuybysheva(Sibrian Physicotechnical Scientific Research Institute at the Tomsk State University im. V. V. Kuybyshev).

PRESENTED: at the meeting of the staff members of the Department for the Physics of Solids

SUBMITTED: March 8, 1960

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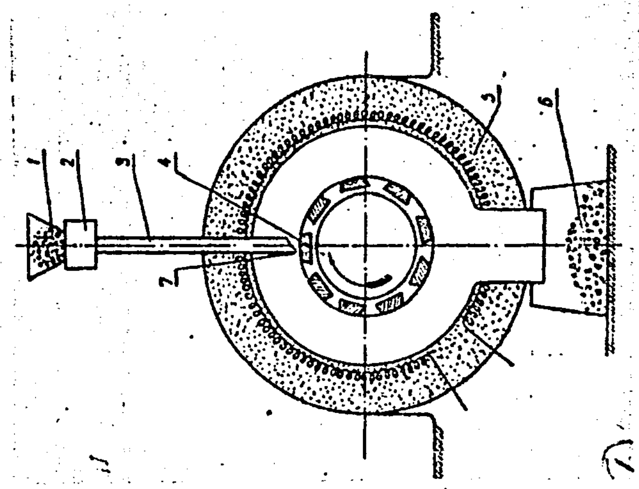
21321

S/143/60/000/012/005/007
A163/A026

Comparative resistance to wear of ....

Figure 1: Experimental device



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21521

10.9230 also 1418, 4016,

S/139/61/000/002/016/018
E073/E535

AUTHORS: Kashcheyev, V. N. and Glazkov, V. M.

TITLE: Resistance to Abrasion and the Bond Forces of the Metal Lattice

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1961, No.2, pp.156-159

TEXT: Wear of a metallic surface as a result of impacts by abrasive particles on its surface is a recurring problem. Whilst in some cases the aim is to increase the resistance to abrasive wear, in others it may be desirable to increase the abrasive effect of the moving mineral particles. V. D. Kuznetsov and V. N. Kashcheyev (Ref.1) described experiments on the wear of technically pure annealed metals by a flow of abrasive particles carried out for the purpose of determining the relation between the wear resistance, the hardness and the Young modulus of metals. The results did not yield an unequivocal dependence of the wear resistance on the hardness and the Young modulus (data from the literature). However, the graphs show a general tendency of an increase in the resistance to wear with increasing hardness and

X

Young modulus. The investigations of M. M. Khrushchov and M. A. Babichev (Refs.2-6) showed that for pure metals in the annealed state there is a direct proportionality between the relative resistance to wear and hardness. Spoor and Newcombe assume that the wear resistance of metals will depend on the elastic properties. According to them, the abrasion wear will be the lower the higher the modulus of elasticity. According to B. M. Rovinskiy (Ref.10) a square relation exists between the resistance to abrasive wear and the modulus of elasticity. According to M. M. Khrushchov and M. A. Babichev (Ref.13) the following relation applies to a large number of metals, alloys and minerals in the case of wear by rigidly embedded abrasive grains:

$$\varepsilon = \text{const}\ E^{1.3}$$

where ε - relative resistance to wear, E - modulus of elasticity. According to the data of the authors of this paper, the relations governing the destruction of metals by freely hitting abrasive grains differ from those pertaining to embedded abrasive grains.

Therefore, experiments were carried out for the purpose of establishing a relation between the abrasive wear by means of a stream of abrasive particles and the modulus of elasticity determined directly on the specimens subjected to wear tests. According to K. V. Savitskiy (Ref.15) the resistance of metals and alloys to abrasive wear depends not only on the strength of the interatomic bond but also on the structural state. In the case of considerable temperature rise, the structural factor may be predominant. From this point of view metals and alloys which are in the metastable state are of particular interest. It is necessary to assume that only under otherwise equal conditions will the wear resistance be determined unequivocally by the interatomic bond forces. The experiments were carried out with annealed specimens of Pb, Mg, Sb, Bi, Zn, Sn, Cd, Ni, Al, Cu and low carbon (0.04%) steel which were in the form of linings of equal dimensions with cylindrical active surfaces of 13 x 21 mm^2. These linings were fixed onto the periphery of a bronze disc of 120 mm diameter. The wear tests were carried out at room temperature by means of a test-rig as shown in Fig.1. A certain charge (3 kg per

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Resistance to Abrasion and ... S/139/61/000/002/016/018
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experiment) of abrasive grains of 500-600 μ was poured into the bunker 1 and allowed to pass at a slow rate, using a special device 2 with a vibrating needle, through a rectangular cross-section vertical tube from a height of 50 cm, onto a disc rotating at 600 r.p.m. and carrying the specimens under test. The gap between the front wall tip of the tube and the rotating disc was about 4 to 5 times smaller than the average dimension of the used grain, therefore, the air flow which was drawn into the gap could turn the falling grains about their centre of gravity without carrying them away. The slow rate of feeding the abrasive grains was necessary to prevent the bouncing off grains from screening falling grains. The wear of the specimens was determined by weighing with an accuracy of up to 0.1 mg. The bouncing off grains from the internal space 5 were collected in the container 6 and recirculated. The obtained results are plotted in terms of the resistance to wear, $1/mm^3$, vs. modulus of elasticity, kg/mm^2, in Fig.2. Each point represents the average of 5 to 10 experiments. The modulus of elasticity was determined by ultrasonics in the Physics Laboratory of the Tomskiy politekhnicheskiy institut (Tomsk Polytechnical Institute), using a device designed by the

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Senior Lecturer A. A. Botaki. The following values of the Young moduli E, kg/mm^2 were obtained: Pb - 1800, Bi - 3000, Mg - 4330, Cd - 5465, Sn - 5640, Sb - 6090, Al - 7190, Zn - 10030, Cu - 12550, Ni - 21220, Fe - 21810. It can be seen that the resistance increases with the Young modulus. The results also show a linear increase in the resistance to abrasion with increasing rigidity, K, of the crystal lattice. Plotting the dependence of K (or the value $m\theta^2$ which is proportional to K) on the elasticity modulus (experimental values), it can be seen that the relation between these is reasonably linear. The modulus of elasticity and the characteristic temperature are characteristics of the bond forces of the crystal lattice; they show little dependence on the temperature and on the structure, which does not apply to the resistance to wear. Although there is no accurate and unequivocal relation, it can be stated that, generally speaking, there is a close relation between these values and the resistance to abrasive wear will be the higher the higher the modulus of elasticity or the value of $m\theta^2$. There are 4 figures and 15 references: all Soviet.

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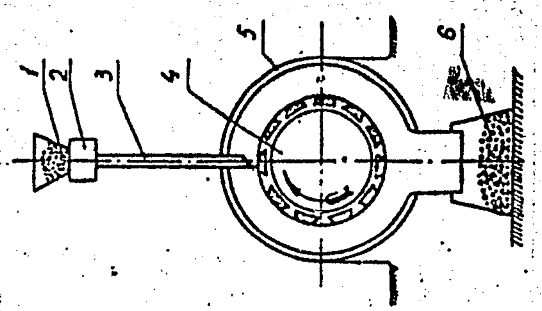
Resistance to Abrasion and ... S/139/61/000/002/016/018
E073/E535

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete imeni V. V. Kuybysheva (Siberian Physico-Technical Institute at the Tomsk State University imeni V. V. Kuybyshev)

SUBMITTED: July 2, 1960

Fig.1



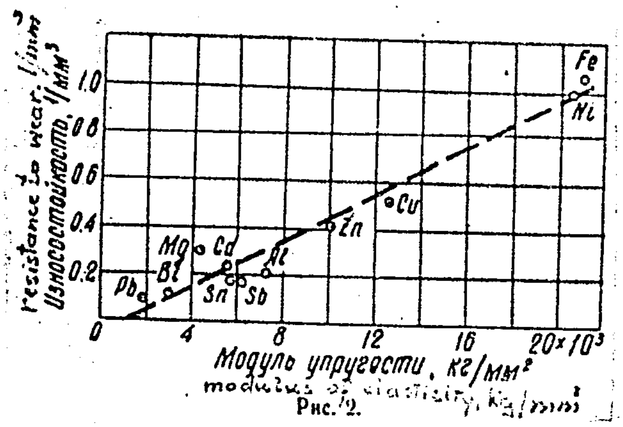


Рис. 2.

Card 6/6

KASHCHEYEV, V.N., kand.fiz.-matem.naul; GLAZKOV, V.M., inzh.

Mechanism of the destruction of a metallic surface by the free impact of an abrasive particle. Izv.vys.ucheb.zav.; energ. 4 no.4:80-85 Ap '61. (MIRA 14:5)

1. Sibirskiy fiziko-tekhnicheskiy nauchno-issledovatel'skiy institut pri Tomskom universitete imeni V.V.Kuybysheva. Predstavlena otdelom fiziki tverdogo tela.
(Mechanical wear) (Metals)

18 8200

25921

S/126/61/012/001/013/020
E193/E480

AUTHOR: Kashcheyev, V.N.

TITLE: Friction-induced deformation of the surface of steel and its effect on resistance to abrasion wear

PERIODICAL: Fizika metallov i metallovodeniye, 1961, Vol.12, No.1, pp.108-117

TEXT: It has been found by many workers that strain-hardening attained by conventional methods does not increase the resistance of metals to wear by abrasion and does not affect their hardness as measured by the width of a scratch inscribed by a pointed indenter under small normal load. At the same time it has been shown by the present author (Ref.18: Izv. vuzov, Fizika, 1959, No.5) that friction-induced deformation of a steel surface increases its resistance to wear by abrasive particles (impinging freely on a rotating test piece) although the resistance to wear by abrasion of pure aluminium, nickel and copper cannot be increased by this treatment. The object of the present investigation was to find an explanation of this effect. The experiments were carried out on a medium carbon steel test piece in the form of a wheel of 120 mm diameter and 20 mm face width which, in the diametrical cross-

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section, represented an I-beam so as to reduce its weight to a value sufficiently low for the application of a micro-analytical balance to estimate the weight losses due to wear. In the surface hardening tests the test wheel was rotated in contact with fast rotating loaded discs of various materials (steels, bronze, glass and thermo-corundum) without or with the application of various lubricants (mineral oil, water, mineral oil plus 0.2% oleic acid). The degree of surface hardening was determined by micro-hardness measurements carried out under the load of 20 g. Two methods were used to study the wear resistance of the test piece. In one, silicon carbide powder (500 to 600 μ particle size) was allowed continuously to fall from a height of 90 or 50 cm on to the cylindrical face of the test piece rotating at 3500 or 6000 rev/min, and after 11 to 12 minutes the loss of weight of the test piece was determined. In the other, a loaded (250 g load) strip of emery paper (No.100) was wrapped around the cylindrical surface of the test piece (the angle of contact being 140°), rotating at 300 rev/min for 20 minutes; again, the degree of wear was determined by measuring the weight loss. The results of the first

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000721010016-3"

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Friction-induced deformation ... S/126/61/012/001/013/020
E193/E480

series of experiments can be summarized as follows.
(1) Dry friction against a low-carbon annealed steel disc produced the highest degree of surface hardening on the normalized test piece whose micro-hardness increased from an initial value of 127 kg/mm² to 964 kg/mm² after this treatment, and a correspondingly high increase in resistance to wear, the loss of weight being 18.2 g after, and 40.2 g before, the treatment. (2) Twofold increase in the wear resistance, determined by the silicon carbide powder method, was observed on all specimens whose surface micro-hardness increased above 500 kg/mm². (3) Although the surface hardness of the test piece, rotated in water against steel ШХ15 (ShKh 15) increased from 127 to only 249 kg/mm², its resistance to wear increased considerably, the weight loss changing from the initial 40.2 g to 28 g; similar results were obtained on test pieces rotated against dry glass discs. In the next series of experiments the effect of sliding speed between the surface of the test piece and that of a low carbon steel disc on the degree of surface hardening was studied. It was found that at sliding speeds greater than 2.6 m/sec and at the normal load of 1000 g, the degree of surface hardening was unaffected by the variation of
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the sliding speed, the micro-hardness remaining constant at 860 kg/mm^2 up to the speed of 11.6 m/sec. At low speeds (0.1 m/sec) and normal loads (300 g) the surface hardness increased from the initial 127 to a final value of 285 kg/mm^2. Similar increase in surface hardness (and in resistance to wear) was caused by machining on a lathe. In the next series of experiments, the resistance to wear by abrasion with bonded abrasive particles (emery paper) was studied. The following 4 test pieces of medium-carbon steel were used: (A) a test piece annealed for 1 hour at 800°C; (B) a test piece surface-hardened by friction against steel ShKh 15 and then tempered at 500°C: (C) a test piece annealed at 800°C and then machined on a lathe; (D) a test piece annealed at 800°C and then surface-hardened by friction against a steel rod, lubricated with mineral oil. The micro-hardness of test pieces A to D was 120, 201, 351 and 679 kg/mm^2 respectively, the corresponding weight losses due to abrasion by a loaded emery paper strip were 62.6, 34.5, 27.9 and 10.8 g. These experiments were followed by metallographic examination of sections of surface-hardened specimens which revealed that the surface layer etched (in

a 4% aqueous solution of HNO_3) more rapidly than the undeformed material of the core and that the friction-hardened layer was not identical with the so-called "white zone", observed by M.V.Rastegayev (Ref.23: Metallovedeniye i termicheskaya obrabotka, 1959, No.12). Analysis of the above described results led the present author to believe that the observed increase in wear resistance of friction-hardened, medium-carbon steel may be associated with phase-transformations taking place during the friction-hardening treatment. Consequently, it was considered necessary to carry out supplementary experiments on a low-carbon ferritic (transformer) steel in which the γ-region is comparatively narrow and in which the austenitic state is more difficult to attain, on a high-carbon steel У10 (U10) and on an austenitic steel ЭЯ1Т (EYa1T), the latter two being surface-hardened by friction at a temperature above the beginning of martensitic transformation and then cooled slowly to room temperature in order to eliminate the possibility of the formation of martensite. In the case of the transformer steel, surface-hardened by friction at room temperature, the micro-hardness increased from 208 to 340 kg/mm^2 but wear resistance was practically unaffected; in the case of steels U10 and EYa1T, surface-hardened by friction at 300 and 130°C respectively, the increase in hardness was insignificant and so was the increase in the wear resistance. It was concluded therefrom that the increase in resistance of the medium-carbon steel to wear by abrasion, attained by friction surface-hardening, is associated with the specific martensitic transformation ($\gamma \rightarrow \alpha$) in the surface layer. This can be inferred from the following facts: (1) The absence of any increase in the abrasion resistance of pure metals whose surface had been deformed by friction. (2) The absence of any change in the wear resistance of steels U10 and EYa1T, whose surface had been deformed by friction in an electric furnace, heated above the temperature of the beginning of the martensitic transformation in these steels. (3) A relatively small increase in the wear resistance of the ferritic steel with a narrow γ-range after the friction-hardening treatment. (4) The considerably higher etching rate of the friction-hardened surface layer compared with that of the adjacent undeformed part of the test piece. (5) Occasional increase in the abrasion resistance not accompanied by a large increase in the hardness of the friction-hardened layer, and the absence of any increase in the abrasion resistance of materials, surface-hardened by the conventional mechanical treatment. (6) The decrease in the width of scratches inscribed on the surface of the friction-hardened specimens. V.V.Chernyshev, B.I.Kostetskiy, L.S.Palatnik are mentioned for their contribution in the field. There are 4 figures, 5 tables and 25 references: 23 Soviet and 2 non-Soviet. The reference to an English language publication reads as follows: Welsh N.C. J.Appl.Phys., 1957, 28 (9), 960.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut (Siberian Physicotechnical Institute)

SUBMITTED: October 31, 1960

KASHCHEYEV, V. N.; GLAZKOV, V. M.

Abrasive wear of prestressed nickel. Fiz. met. i metalloved. 14 no.4:608-612 O '62. (MIRA 15:10)

1. Sibirskiy fiziko-tekhnicheskiy nauchno-issledovatel'skiy institut.

(Nickel—Cold working)
(Mechanical wear)

KASHCHEYEV, V.N., starshiy nauchnyy sotrudnik; SOLOMEIN, I.A., nauchnyy sotrudnik

Effect of temperature conditions in a friction unit on its wear. Izv. vys. ucheb. zav.; mashinostr. no.11:162-167 '63. (MIRA 17:10)

1. Tomskiy gosudarstvennyy universitet.

KASHCHEYEV, V. P.

"Abrasive Grain and Abrasive Destruction of the Surface of a Solid Body." Cand Phys-Math Sci, Tomsk U, Tomsk, 1954. (RZhFiz, Nov 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (11)

SO: Sum. No. 521, 2 Jun 55

[redacted]

KASHCHEYEV, V.V., inzh.; OGLOBLIN, V.N., inzh.

Reducing accidents in Kirghizia mines. Bezop. truda v prom. 5 no. 2:14-15 F '61. (MIRA 14:2)

1. Gosgortekhnadzor Kirgizskoy SSR.
(Kirghizistan—Mining engineering—Safety measures)

KASHCHEYEVA, G. M.

BUSHMICH, D.G., starshiy nauchnyy sotrudnik; KASHCHEYEVA, G.M., mladshiy nauchnyy sotrudnik.

Diagnostic significance of the agglutination of virus-coated bacteria in trachoma. Oft.zhur. 13 no.7:387-391 '58. (MIRA 12:1)

1. Iz Ukrainskogo nauchno-issledovatel'skogo ins[illegible]tuta glaznykh bolezney i tkanevoy terapii imeni akademika V.P. [illegible]latova (dir. - prof. N.A. Puchkovskaya).

(CONJUNCTIVITIS, GRANULAR)
(BLOOD--AGGLUTINATION)

BUSHMICH, D.G., doktor med.nauk; KASHCHEYEVA, G.M., mladshiy nauchnyy sotrudnik

Frequency of the detection of trachomatous antibodies in trachoma patients. Oft.zhur. 15 no.1:34-38 '60. (MIRA 13:5)

1. Iz Ukrainskogo nauchno-issled. eksperimental'nogo instituta glaznykh bolezney i tkanevoy terapii imeni akad. V.P. Filatova (direktor - prof. N.A. Puchkovskaya).
(ANTIGENS AND ANTIBODIES) (CONJUNCTIVITIS, GRANULAR)

BARKOV, N.N., kand. ekon. nauk; Prinimali uchastiye: PONOMAREV, S.A., inzh.; YELISEYEVA, T.V., inzh.; MOLYARCHUK, G.V., kand. ekon. nauk; IVANOV, L.N., inzh.; KASHCHEYEVA, I.N., inzh.; LEGORNEVA, V.I., inzh.; KUZ'MINA, T.T., inzh; INOZEMTSEVA, K.N., inzh.; YANDOLOVSKIY, N.A., inzh.; PAVLOVA, Ye.A., starshiy tekhnik; VOLKOVA, L.S., starshiy inzh.; GAZAR'YAN, G.S., tekhnik; VOROB'YEVA, L.V., tekhn. red.

[Seasonal and weekday variations in railroad freight transportation]. Sezonnaia i vnutrinedel'naia neravnomernost' gruzovykh perevozok na zheleznykh dorogakh. Moskva, Transzheldorizdat, 1963. 95 p. (Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut zheleznodorozhnogo transporta. Trudy, no. 249). (MIRA 16:4)

(Railroads—Freight)

SOV/137-58-7-14063

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 7, p 12 (USSR)

AUTHORS: Treyger, I. N., Kashcheyeva, N. A., Savranskaya, A. P.

TITLE: Determining the Reducibility of the Sinter at the Zaporozhstal' Plant (Opredeleniye vosstanovimosti aglomerate na zavode "Zaporozhstal'")

PERIODICAL: Byul. nauchno-tekhn. inform. Ukr. n.-i. in-t metallov, 1957, Nr 2, pp 84-89

ABSTRACT: Improvement in the methods of determining the reducibility of the sinter makes it possible to run 20-24 analyses per day instead of 5. The sinter sample taken is 200 g in the 8-10 mm fraction at 800±5°C. The gas flow is continued for 1 hour 25 min, and the rate of gas passage is 3.4 liters/min, the total gas consumption being 290 liters. For better employment of the furnaces, 2 reaction tubes are assigned to each (to permit one tube to be charged while the other is cooling). Their design has been improved: size is reduced by 60 percent, the Fe crucible is replaced by a screen floor, and the method of sealing the reaction tube has been changed (bolted flanges have been replaced by a threaded cover). Three reaction furnaces

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SOV/137-58-7-14063

Determining the Reducibility of the Sinter at the Zaporozhstal' Works

have been installed. Blast-furnace gas may be used instead of producer gas. Blast-furnace gas containing 10% CO_2, 0.5% O_2, and 30.5% CO acquires the following composition after being passed through a 30% caustic or pyrogallol solution: 0.5% CO_2, no O_2, and 32.8% CO.

G. F.

1. Ores--Processing 2. Sintering furnaces--Performance 3. Gases--Applications

Card 2/2

SOV/133-58-10-30/31

AUTHORS: Treyger, IN, ~~Kashcheye J., N.A.~~ and Savranskaya, A.P.

TITLE: Tin Recovery from Waste Products of Tin Plating (Izvlecheniye olova iz otkhodov luzheniya zhesti)

PERIODICAL: Stal', 1958, 19 Nr 10, pp 957-959 (USSR)

ABSTRACT: During hot tinning of white tinplate, only 80% of tin is actually consumed for tinning; the remaining 20% is transferred into waste products. A chemical method of recovery of tin from the waste products is proposed. It consists of dissolving waste products in hydrochloric acid and, after dilution with water, tin is precipitated in the form of sponge by zinc. Tin sponge is washed, pressed into briquettes and smelted under flux. Tin recovered in this way is suitable for the manufacture of white tin plate. The solution of zinc and ferrous chlorides, which remains after the separation of tin sponge, is treated with 30% hydrogen peroxide to oxidise ferrous iron to ferric iron, which is then precipitated with 25% ammonia (pH = 2). The precipitated ferric hydroxide is separated either by settling or centrifuging and the

Card1/2

SOV/133-58-10-30/31

Tin Recovery from Waste Products of Tin Plating

remaining zinc chloride solution is evaporated to a sp.gr. 1.52-1.54, purified from sulphate ions by treatment with $CaCl_2$ and used as a flux for tinning.

There is 1 figure.

ASSOCIATION: Zavod "Zaporozhstal'" ("Zaporozhstal'" Works)

Card 2/2

KASHCHEYEVA N.P.

AKIMENKO, A.D., kand. tekhn. nauk; GREKK, V.A., inzh.; KASHCHEYEVA, N.P., inzh. KUZELEV, M.Ya., inzh.; SKVORTSOV, A.A., kand. tekhn. nauk; CHUMAGIN, V.S., inzh.

Utilizing waste nitrogen from oxygen plants as a protective atmosphere for metal heat treatment in furnaces. Vest. mash. 38 no.4: 40-42 Ap '58. (MIRA 11:3)
(Metals--Heat treatment) (Protective atmospheres) (Nitrogen)

KASHCHEYEV, N. T.

KASHCHEYEV, N. T.: "Ways of improving the economy of the repair of automatic brakes of freightcars on the railroads of the USSR." Min Railways USSR. All-Union Sci Res Inst of Railroad Transport. Moscow, 1955. (Dissertation for the Degree of Candidate in Technical Sciences.)

Source: Knizhnaya letopis' No 40 1956 Moscow

KASHCHEYEV, N.T.

Mechanization of oil drainage from tank cars. Zhel.dor.transp. 41 no.8:59-61 Ag '59. (MIRA 12:12)

1. Zamestitel' nachal'nika Glavnogo upravleniya vagonnogo khozyaystva.
(Petroleum--Transportation) (Tank cars--Cleaning)

INOZEMTSEV, V.G., inzh.; KASHCHEYEV, N.T., inzh.

Increasing the operational reliability of automatic brakes. Zhel. dor.transp. 42 no.11:27-30 N '60. (MIRA 13:11)
(Railroads--Brakes)

KASHCHEYEV, N.V., inzh.

Using machinery in making prefabricated room units. Mekh. stroi. 17 no.4:16-18 Ap '60. (MIRA 13:6)
(Precast concrete construction)

KASHCHEYEV, N.V., inzh.

The over-all mechanization of the loading and unloading of cement. Mekh.stroi. 17 no.2:14-16 F '60. (MIRA 13:8)
(Loading and unloading)
(Cement--Transportation)

TSEFT, A.L., akademik; KASHCHEYEVA, T.V.

Chemical concentration of manganese ores from the Ikat-Garga deposit. Vest. AN Kazakh. SSR 19 no.12:30-40 D '63. (MIRA 17:12)

1. Akademiya nauk Kazakhskoy SSR (for TSeft).

KASHCHEYEVA, T.V.; TSEFT, A.L.

Value of the pH at which the precipiate begins to form in the processes of manganese precipitation from solutions of its salts. Trudy Vost.-Sib.fil. AN SSSR no.25:43-51 '60. (MIRA 13:9)
(Manganese)

TSEFT, A.L.; KASHCHEYEVA, T.V.

Precipitation of manganese from simple and complex solutions obtained from the treatment of manganocalcite ores. Trudy Vost.-Sib.fil. AN SSSR no.25:34-42 '60. (MIRA 13:9)

(Manganese)

S/137/62/000/001/035/237
A060/A101

AUTHORS: Kashcheyeva, T. V., Tseft, A. L.

TITLE: Precipitation of manganese hydroxide at constant pH of the solution

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 1, 1962, 23, abstract 1G175, ("Izv. AN KazSSR. Ser. metallurgii, obogashcheniya i ogneuporov", 1961, no. 2, 33-38, Kaz. summary)

TEXT: The process of hydrate formation in dilute solutions of Mn chloride was studied by the method of precipitation at constant pH. It was established that at pH 8.5 - 9.5 the concentration of Mn ions in the solution varies from 4.2 to 0.07 g/liter, and pure Mn hydroxide is precipitated out.

G. Svodtseva

[Abstracter's note: Complete translation]

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FEDOT'YEV, N.P.; VYACHESLAVOV, P.M.; KASHCHEYEVA, Ye.A.

Study of some "structure-sensitive" properties of Ni-Co galvanic alloys. Zhur. prikl. khim. 36 no.11:2474-2477 N '63. (MIRA 17:1)

KASHCHEYEVA, YE.D.

VARLAMOV, V.S., kandidat tekhnicheskikh nauk; PEDAYAS, V.M., inzhener; GRIGORASHVILI, Ye.I., inzhener; KASHCHEYEVA, Ye.D., inzhener; ASEYEVA, A.A., inzhener. [redacted]

Production of synthetic fatty alcohols. Masl.-zhir.prom. 23 no.7:27-30 '57. (MLRA 10:8)

1.Vsesoyuznyy nauchno-issledovatel'skiy institut zhirov (for Varlamov, Pedayas) 2.Shebekinskiy kombinat sinteticheskikh zhirnykh kislot i zhirnykh spirtov (for Grigorashvili, Kashcheyeva, Aseyeva)
(Alcohols)

VARLAMOV, V.S., kand.tekhn.nauk; PEDAYAS, V.M.; GRIGORASHVILI, Ye.I., inzh.; KASHCHEYEVA, Ye.D., inzh.

Production of aliphatic alcohols from liquid petroleum paraffin. Masl.-zhir.prom. 26 no.2:25-27 F '60. (MIRA 13:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut zhirov (for Varlamov, Pedayas). 2. Shebekinskiy kombinat sinteticheskikh zhirnykh kislot i zhirnykh spirtov (for Grigorashvili, Kashcheyeva).
(Paraffins) (Alcohols)

RASHEVSKAYA, S.T.; KASHCHEYEVA, Ye.S.; MOSTOSLAVSKAYA, E.I.

Formation of dinitro-substituted derivatives during nitration of -phenyl ethyl alcohol. Zhur.ob.khim. 33 no.12:3998-4002 D '63. (MIRA 17:3)

ZAKHAROV, I.A.; KASHCHEYEVA, Z.I.

Application of primary suture after 24 hours. Feldsher & akush. no.2: 52-53 Feb 51. (CIML 20:8)

1. Lisichansk, Voroshilovgrad Oblast.

SOKHIN, V.G., inzh.; KASHCHICH, A.M., inzh.

Design of the pickup units of metal locators. Sbor. trud. VNIINerud no.2:112-123 '62. (MIRA 16:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut nerudnykh stroitel'nykh materialov i gidromekhanizatsii.

(Metal detectors)

KASHCHUK, A.P., inzh.; KURDIKOV, B.A.; SMOLOV, V.B., doktor tekhn. nauk; CHERNAVSKIY, Ye.A., kand. tekhn. nauk

Universal transistorized digital-analog function generator. Priborostroenie no.5:15-17 My '65. (MIRA 18:5)

TOPIC TAGS: function generator, digital analog [illegible]

$U = \sin 0.5\pi \frac{t}{\ }$ [illegible]

KHSHCHUK,F.

KASHCHUK,F.

A mine section which had lagged behind is now coming out in front. Mast.ugl.4 no.8:13 Ag'55. (MLRA 8:10)

1. Nachal'nik uchastka shakhty no.1-2 "Gorskaya" Voroshilovgradskoy oblasti

(Donets Basin--Coal mines and mining)

KASHCHUK, M.G., inzh.

Welding with a small diameter powder wire. Svar. proizv. no.4: 34-35 Ap '65. (MIRA 18:6)

1. Bryanskiy filial MPKTI Priokskogo soveta narodnogo khozyaystva.

KASHCHUK, M.G., inzh.

Powder wire for semiautomatic welding of cast iron without additional arc shielding. Svar. proizv. no.8:24-25 Ag '65. (MIRA 18:8)

1. Bryanskiy filial MPKTI.

KASHCHUK, V.

Letter to the editors. Izv. vys. ucheb. zav.; chern. met. 5 no.10:208 '62. (MIRA 15:11)

1. Tomskiy politekhnicheskiy institut.
(Tool steel--Testing)

KASHCHUK, V.A., inzh.

Cast high-speed steel with cobalt. Izv.vys.ucheb.zav.; chern.met. 2 no.8:113-116 Ag '59. (MIRA 13:4)

1. Tomskiy politekhnicheskiy institut. Rekomendovano kafedroy metallovedeniya Tomskogo politekhnicheskogo instituta.
(Tool steel--Metallography)

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S/129/61/000/002/009/014
E073/E335

AUTHOR: Kashchuk, V.A., Engineer

TITLE: Cast Cobalt High-speed Steels

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1961, No. 2, pp. 40 - 42

TEXT: The author studied the influence of cobalt on high-speed steel of the following average composition: 1.5% C; 20% W; 5.5% Cr; 5% V. Six experimental heats were produced in a high-frequency induction furnace. The chemical composition, in %, of these six heats was as follows:

Heat No.	C	W	Cr	V	Co
1	1.55	20.08	5.52	5.01	-
2	1.53	20.19	5.65	5.17	5.65
3	1.49	10.12	5.58	5.21	12.48
4	1.61	20.24	5.48	5.25	16.00
5	1.50	20.18	5.40	5.09	20.41
6	1.47	20.14	5.46	5.13	26.81 .

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Cast Cobalt High-speed Steels

The crucible of the furnace had a capacity of 2 kg and had an acidic lining. Factory scrap of steel P18 (R18) and ferro alloys were used as a charge and also specially prepared high-carbon pig iron. Prior to teeming 0.1% Al and 0.22% Ti were introduced. Casting was by means of a centrifugal machine into chill moulds. The quality of the cast tool, its cutting properties and mechanical strength are determined by its structure. Fracture photographs showed that all the experimental steels had a fine-grain fracture. For the steels from the heats 1-4 the macrostructure did not reveal dendritic structure. However, for the steel from the heats 5-6 a definite orientation of the grains was observed, which is characteristic for a dendritic structure. The as-cast structure of cobalt high-speed steel appears to be a hardening structure consisting of martensite, austenite, a carbide eutectic and carbides that are uniformly distributed along the entire polished specimen in the form of individual

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Cast Cobalt High-speed Steels

grains. With increasing cobalt content, the quantity of the residual austenite increases in the steel after casting. In the as-cast state, the hardness values were as follows: with 0% Co - HRC 54; 5.6% Co - HRC 63.5; 12.5% Co - HRC 64; 16% Co - HRC 60; 20.5% Co - HRC 52; 26.8% Co - HRC 48. After casting into chill moulds the plates for the cutting tools were subjected to a treble tempering at 650 °C, with a holding time of 1 hour. The measured hardness values (HRC) after temperaing once, twice and three times were as follows

Temperings	Cobalt content, %					
	0	5.6	12.5	16	20.5	26.8
I	54	64.5	65	63	61.5	51.5
II	54	64.5	67	66	63.5	51.5
III	54	64.5	67	68	70.0	51.5 .

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It can be seen that for the steels 1 and 6 the hardness did not increase during the process of treble tempering. Absence of a secondary hardness in heat 1 can be explained by the insignificant quantity of residual austenite obtained as a result of incomplete quenching of the steel. In the steel from the heat 6, the absence of a secondary hardness is apparently due to the high stability of tempering of the residual austenite; additional tempering at 560 °C brought about a decomposition of the austenite in the case of heat 6. After additional temperings, the hardness of the steel from heat 1 was HRC 56 and therefore this steel cannot be recommended for use in cutting tools without a full heat-treatment cycle applied for forged high-speed steel. The stability in the red-hot state of the tested steels is characterised by the maximum temperature of four temperings, each lasting one hour up to which the steel maintains a hardness not below HRC 60. Individual specimens were tested for each of the heating temperatures. It was found that Co increases the stability

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in the red-hot state of the cast steel. Machining tests were made on lathe cutting tools using the method of longitudinal turning. The plates of the experimental steels (8 x 15 x 28 mm) were clamped into a holder. The cutting tools ($\gamma = 12^\circ$, $\alpha = 8^\circ$, $\varphi = 45^\circ$, $\varphi' = 15^\circ$, t = 1 mm) were tested on a thread-cutting lathe on steel (9KhS) of hardness HB 240 with a machining speed of 32 m/min, a depth of cut of 2.5 mm and a feed of 0.5 mm per revolution without using any coolant. Data on the service life are given in Table 3. Blunting of the cutting tools occured without chipping-off or flaking of the metal. Bending tests were made on 4.5 x 4.5 mm, 52 mm long, specimens. The heat treatment (except for heat No. 6) consisted of treble tempering at 650 °C for 1 hour. Specimens from heat No. 6 were subjected to bending tests after heat treatment, as shown in Table 3. The bending strengths of the steels of the heats 2, 3, 4, 5, and 6 were respectively 158, 206, 189, 163 and 126 kg/mm^2. The following conclusions were arrived at:

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Cast Cobalt High-speed Steels

1) during the process of cooling of the castings in chill moulds the steels from the heats 2-6 were quenched from the highest possible temperatures. The structure of the investigated steels was more fine-grained than the structure of steel R18, cast in chill moulds.

2) Heat treatment of the tools from the experimental cobalt steels cast in chill moulds consists only of tempering.

3) If over 20% Co is introduced, dendritic structure can be observed after casting. The Co increases the quantity of residual austenite during quenching, the red-hardness and the machining properties.

4) Tools from the tested steels containing 20% Co have a satisfactory strength.

5) The author recommends manufacturing cutting tools by casting into chill moulds of steels containing about 1.5% C, 20% W, 5.5% Cr, 5% V and 6-20% Co. There are 1 figure, 3 tables and 9 Soviet references.

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Cast Cobalt High-speed Steels

Table 3: Service Life of Cutting Tools Produced from the Experimental Steels

Heat No.	Heat-treatment of Plates Prior to the Tests	Hardness HRC	Service Life, %
R18, forged	The one usual for this steel	63.5	100
2	Treble tempering at 560 °C for 1 hour each	65.0	520
3	Treble tempering at 560 °C for 1 hour each	67.0	1010
4	Treble tempering at 560 °C for 1 hour each	68.0	1630
5	Treble tempering at 560 °C for 1 hour each	70.0	2410
6	Tempering at 670 °C for 1 hour, followed by double tempering at 560 °C for 1 hour each	66.0	2820

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