

*122-2-13/23*

AUTHOR: Karpenko, G.V., Doctor of Technical Sciences, Professor, and Tynnyy, A.N., Babey, Yu.I., Engineers. 122-2-13/23

TITLE: On the depth of the sulphur-enriched layer in the sulphiding of steel and cast iron (O glubine sloya, obogashchennogo seroy pri sul'fidirovani stali i chuguna)

PERIODICAL: "Vestnik Mashinostroyeniya" (Engineering Journal), 1957, No.2, pp. 61 - 62 (U.S.S.R.)

ABSTRACT: Medium temperature (540 - 570 C) sulphiding in a solid, liquid or gas medium has been claimed by the Minsk Motorcar Plant (Minskiy Avtozavod) to produce sulphur diffusion to a depth of up to 0.3 mm and to yield a better wear resistance in tools and machine components. These claims were examined by the use of the radio-active S35 having a beta radiation of 0.17 MeV. The test technique is described. 0.0021% of radio-active FeS was added to the FeS in the sulphiding bath (containing 13.2% FeS). The tests show sulphur penetration to a depth of 16  $\mu$  in steel and 30  $\mu$  in cast iron. The wear resistance due to the anti-friction and anti-seizure properties of sulphur is restricted to this thin layer.

Card 1/1 There are 2 figures, including 1 graph and 4 Slavic references.

AVAILABLE: Library of Congress

S/723/61/000/001/005/005

**AUTHORS:** Karpenko, G. V., Babey, Yu. I., Kripyakevich, R. I.

**TITLE:** On hydrogen fatigue of steel under cathodic protection.

**SOURCE:** Vliyaniye rabochikh sred na svoystva stali. vyp. 1: Sredy, vyzyvayushchiye navodorozhivaniye stali. In-t mash. i aytom., AN UkrSSR, Kyev, Izd-vo AN UkrSSR, 1961, 59-64.

**TEXT:** An experimental investigation has shown that under cathodic protection of cyclically stressed steel parts their endurance is impaired because of the action of electrolytically penetrated H (the "H fatigue of steel"). It is established that this phenomenon is intensified with an increase in the current density of the cathodic polarization. When the current density is small, anodic corrosion processes occur. The development of H fatigue is impeded if the electrolyte is not sufficiently stirred, owing to the formation of an alkaline zone. A special equipment was constructed (cross-section shown) for the fatigue testing of a metal under simultaneous hydrogenation. This equipment was used in conjunction with the IMA-30 testing machine; it was constructed by the Institute of Machine Science and Automatics, AS UkrSSR, and was capable of testing 10-30-mm diam specimens by pure cyclic flexure during rotation. The specimens actually used had 20-mm diam in their working portion. They were made of steel 45 (0.45% C, 0.65% Mn, 0.34% Si, 0.035% S, 0.021% P).  
Card #/2

On hydrogen fatigue of steel under cathodic . . . .

S/723/61/000/001/005/005

0.03% Ni, 0.05% Cr,  $\sigma_b = 70 \text{ kg/mm}^2$ ,  $H_B = 207$ ). The corrosive medium tested was a 3% solution of NaCl in faucet water, which, to a degree, simulates sea water. The specimen served as the cathode, and a Pt anode was employed. The electrolyte was introduced under a small pressure, so that the working part of the specimen was fully immersed. Polarization was achieved through a rectifier and a rheostat, which provided a current density ranging from 0.007 to 6.2 amp/dm<sup>2</sup>. The tests in air were performed on a basis of  $10^7$  cycles and in the corrosive medium, at  $2 \cdot 10^7$  cycles. The values of the fatigue limit vs. the cathode current density are graphed, together with fatigue limit vs. the number of cycles, with the current density as a parameter. It was noted that there is an optimal current density (0.15 amp/dm<sup>2</sup> for the conditions of the present investigation), at which the anodic process comes to a total standstill and the fatigue strength attains a maximal value, which however is still 10% lower than in air, a phenomenon that is attributed to H fatigue. It is concluded that, in any stress analysis of parts that may have to operate under conditions similar to those tested, the effect of H fatigue should be taken into account, together with the specific conditions of the electrolyte exchange that may occur in the respective practical case. There are 3 figures and 6 references (5 Russian-language Soviet and 1 English-language: Evans, U.S., Metallic corrosion, passivity, and protection, 2d ed., London, Edward Arnold, 1946, in Russian translation).

Card 2/2

KARPENKO, G.V.; BABEY, Yu.I.; KRIPYAKEVICH, R.I.

Hydrogen fatigue in steel during cathodic protection. Vliian.  
rab.sred.na svois.stali no.1:59-64 '61. (MIRA 15:5)  
(Steel--Hydrogen content) (Cathodic protection)

KARPENKO, G.V.; LITVIN, A.K.; BABEY, Yu.I.

Changes in the microhardness of structural components in steel  
during its pickling in nitric acid solutions. Vliien.rab.sred.  
na svois.stali no.1:80-83 '61. (MIRA 15:5)  
(Steel—Pickling) (Hardness)

188310

28704

S/021/61/000/003/009/013  
D274/D301

AUTHORS: Kryp'yakevych, R.I., Babey, Yu.I. and Karpenko, G.V.  
TITLE: On the role of hydrogen in corrosion fatigue-failure  
of steel  
PERIODICAL: Akademiya nauk UkrSSR. Dopovidi, no. 3, 1961, 325-  
327

TEXT: An experimental study of corrosion fatigue is described. The experiments showed that the reduction in fatigue strength can be related exclusively to the cathode process and the absorption and diffusion of hydrogen involved. The specimens were made of steel 45 and had a diameter of 20 mm. The corrosive substance was a 3% NaCl-solution in water (similar to sea-water), which was introduced through tube 1, separator 2, and tube 3 of Fig. 1. The anode was platinum wire 4, the cathode - the specimen. The current density varied between 0.007 to 6.2 amp/dm<sup>2</sup>. It is noted that conditions of flow of the electrolyte have a considerable effect on

Card 1/6

X

28704

S/021/61/000/003/009/013  
D274/D301

On the role of hydrogen...

the cathode process and on the hydrogenization. A figure shows the dependence of the conditional corrosion-endurance limit  $\sigma_{-1}^N$  on the current density  $D_c$ . The experiment led to the following conclusions: 1) The increase (within certain limits) of the current density with cathode polarization, leads to a decrease in the intensity of the anode process, as a result of which the endurance limit  $\sigma_{-1}^N$  increases. 2) With optimum current-density (under the given conditions,  $D_c \approx 0.15$  amp/dm<sup>2</sup>), the anode process ceases altogether;  $\sigma_{-1}^N$  reaches its maximum value, which is by 10% lower than the endurance limit in air  $\sigma_{-1}$ . This can be explained by the presence of the cathode process, and by adsorption and diffusion effect. 3) An increase in the current density above the optimum value, leads to an intensification of the cathode process and to a decrease in  $\sigma_{-1}^N$ . 4) Cathodic protection cannot, even with optimum choice of current density, completely reestablish the fatigue-limits of the metal. The character of the fatigue-curves in the cathode process shows that this process develops with time, leading

Card 2/4

X

On the role of hydrogen...

28704  
S/021/61/000/003/009/013  
D274/D301

to a further decrease in metal endurance. This has to be taken into account in calculating endurance of parts which are subject to sign-changing loading and to corrosion. There are 3 figures and 5 references: 4 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Instytut mashynoznavstva ta avtomatyky AN USSR  
(Institute of the Science of Machines and Automation AS UkrSSR)

PRESENTED: by Academician Yu.K. Delimars'kyi AS UkrSSR

SUBMITTED: July 19, 1960

Card 3/4



S/123/62/000/018/002/012  
A006/A101

AUTHORS: Babey, Yu. I., Karpenko, G. V.

TITLE: The effect of high-speed and force cutting, and of technical prehistory upon fatigue strength of steel

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 18, 1962, 16, abstract 18A92 ("Nauchn. zap. In-ta mashinoved. i avtomatiki AN UkrSSR, Ser. mashinoved." 1961, v. 8, 41 - 58)

TEXT: It is shown that parts worked on a lathe under different conditions of cutting, assuring equal roughness of the surface, show different endurance limits. High speed cutting conditions increase, and force cutting conditions reduce the endurance limit, as compared with conventional turning in both air and a corrosion medium; this occurs to a particularly high degree in the latter case. Grinding of the parts after turning under different cutting conditions does not eliminate the effect of preliminary mechanical treatment upon the endurance limit, i.e. an effect of technical prehistory is observed. This effect upon the fatigue strength of steel is higher in a corrosion medium than in air. ✓

[Abstracter's note: Complete translation]  
Card 1/1

S/123/62/000/023/002/008  
A004/A101

AUTHORS: Babey, Yu. I., Karpenko, G. V.

TITLE: The effect of mechanical working on the fatigue strength of steel after its preliminary atmospheric corrosion

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 23, 1962, 14, abstract 23A99 ("Nauchn. zap. In-ta mashinoved. i avtomatiki, AN UkrSSR. Ser. mashinoved.", 1961, v. 8, 65 - 71)

TEXT: The authors analyze the effect of mechanical working (ordinary lathe work, forced and high-speed cutting, and also grinding and roller bur-nishing after ordinary turning) on the fatigue strength of grade 45 steel after preliminary atmospheric corrosion tests of 1,000 hours duration. The tests were conducted on the ИМ А -30 (ИМА-30) machine on the base of  $10 \cdot 10^6$  cycles. It was proved that various forms of machining lead to different losses in weight from atmospheric corrosion and to different magnitudes of fatigue strength, the surface finish being the same. The most considerable effect on the fatigue strength is exerted by the atmospheric corrosion of specimens that have been

Card 1/2

The effect of mechanical working on...

S/123/62/000/023/002/008  
A004/A101

machined by forced cutting or grinding; in this case the fatigue strength is reduced by 14 - 16%.

[Abstracter's note: Complete translation]

Card 2/2

BABY, Yu.I.; KARPENKO, G.V.

Effect of high-speed and heavy-feed machining and technological  
inherence on the fatigue resistance of steel. Nauch.zap.IMA AN  
URSR. Ser.mashinoved. ? no.7:41-58 '61. (MIRA 15:1)  
(Steel--Fatigue)

BABEY, Yu.I.; KARPENKO, G.V.; LITVIN, A.K.

Effect of cutting conditions on the surface hardening in machining  
steel 45 on lathes. Nauch.zap.IMA AN URSR. Ser.mashinoved. 7 no.7:  
59-64 '61. (MIRA 15:1)

(Steel) (Turning)

BABEY, Yu.I.; FARPENKO, G.V.

Effect of machining on the fatigue resistance of steel after its preliminary corrosion under atmospheric conditions. Nauch.zap.Izv. AN URSS. Ser.mashinoved. ? no.7:65-71 '61. (MIRA 15:1)  
(Steel--Fatigue)

<sup>I</sup>  
BABBY, Yu. [Babei, IU.], inzh. (L'vov); STEPURENKO, V., kand. tekhn.  
nauk (L'vov)

What is metal fatigue. Znan. ta pratsia no.6:10-11 <sup>Je</sup> '62.  
(MIRA 16:7)  
(Metals--Fatigue)

STEPURENKO, V.T.; BABEY, Yu.I.; KARPENKO, G.V.

Effect of mercury on the strength and alternating bending  
testing of steel. Nauch.zap. IMA AN URSR. Ser. mashinoved. 9:34-36  
'62. (MIRA 15:12)

(Steel--Testing)

(Mercury)



S/676/62/009/000/006/010  
A006/A101

AUTHCRS: Kripyakevich, R. I., Babey, Yu. I., Karpenko, G. V.

TITLE: On the possible appearance of hydrogen brittleness in steel during its deformation in neutral corrosion media

SOURCE: Akademiya nauk Ukrayins'koyi RSR. Instytut mashynoznavstva i avtomatyky, L'viv. Nauchnyye zapiski. Seriya mashinovedeniya. v. 9, 1 1962, Voprosy mashinovedeniya i prochnosti v mashinostroyeni, no. 8, 47 - 50

TEXT: The decrease of mechanical properties of steel parts under the effect of neutral electrolytes, accompanied by polarization, might be caused by hydrogen. The singling out of hydrogen ions can take place at a sufficient current density of cathode polarization from an external voltage source, or at a sufficient difference of potentials between the micro-electrode sections of the metal surface. Both cases were studied and the nature of metal deformation in the process of hydrogenization was determined. The following 3 cases were investigated: 1) cyclic bending below the yield limit; 2) uni-axial tension be-

Card 1/3

On the possible appearance of... :

S/676/62/009/000/006/010  
A006/A101

yond the yield limit; 3) alternating bending beyond the yield limits. The corrosion medium was a 3%-solution of sodium chloride; current density was 0.07 - 15 amp/dm<sup>2</sup>; the specimens were made of pre-eutectoid steel. An analysis of the results obtained leads to the following conclusions. In all types of deformation, polarization from the external power source causes a decrease in the mechanical properties. For case 2 and 3 the neutral corrosion medium reduces these indices even without polarization from the external source. The dependence curves of mechanical characteristics show, for all the cases, a maximum in the range of lower current densities. An increase in the current density toward both the anode and cathode reduces the indices of mechanical characteristics, which is explained for the former case by intensified anodic processes and for the latter case by hydrogenization of the metal, entailing hydrogen fatigue and brittleness. The inclination of the curves indicates the predominance of either the anodic or cathodic process, or their equilibrium. As the deformation intensity increases from the first to the third case, the maximum is shifted from the anode to the cathode. This indicates an increasing difference of potentials between the micro-anodic and micro-cathodic sections of the steel surface. As a result, in the third case conditions are developed for the hydrogenization of

Card 2/3

On the possible appearance of...

S/6'6/62/009/000/006/010  
A006/A101

the steel over the micro-cathodic sections, even without polarization. To eliminate the cathodic process it is necessary to produce anodic polarization of 0.07 amp/dm<sup>2</sup> current density, which prevents hydrogenization. There is 1 figure.

SUBMITTED: February 7, 1961

Card 3/3

BABY, Yu.I.; KARPENKO, G.V.

Effect of high-speed and heavy-feed machining and of inherited engineering efficiency on the fatigue strength of heat-treated steel 45. Nauch.zap. IMA AN URSR. Ser. mashinoved. 9:55-67 '62.  
(MIRA 15:12)

(Steel--Fatigue)

YANKOVSKIY, L.A.; STEPURENKO, V.T.; BAHEY, Yu.I.

The IMA-~~101~~ machine for fatigue testing of metals subjected to repeated variable bending in the plastic area. Nauch.ap.IMA  
AN URSR.Ser.mashinoved. 9:77-79 '62. (MIRA 15:12)  
(Fatigue testing machines) (Metals--Testing)

S/020/62/145/001/017/018  
B145/B101

AUTHORS: Karpenko, G. V., Babey, Yu. I., and Kripyakevich, R. I.

TITLE: Hydrogen fatigue of steel

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 145, no. 1, 1962, 144 - 146

TEXT: The fatigue of cyclically stressed steel 45 in 3 % NaCl solutions, during cathodic polarization and anodic polarization and in air, was investigated in order to determine the optimum conditions for cathodic protection and the corrosion resistance of the metal. The cyclic stress was applied by an WMA-30 (IMA-30) machine, ( $20 \cdot 10^6$  cycles in the corrosive medium and  $10 \cdot 10^6$  cycles in air), the electrolyte being well mixed. The density of the polarization current varied between 0.007 and 6.2 a/dm<sup>2</sup>. An endurance limit of cathodic protection (the stress at which destruction does not set in when either the time or the cycles of stress are increased) was not observed. The conventional endurance limit,  $\sigma_{-1}^N$ , decreased with time over the whole region of current density. The function  $\sigma_{-1}^N = f(D_0)$ ,

Card 1/2

Hydrogen fatigue of steel

S/020/62/145/001/017/018  
B145/B101

or  $\sigma_{-1}^N = f(D_a)$  (where  $D_c$  = cathodic current density,  $D_a$  = anodic current density) showed that the intensity of the anodic process leading to corrosion fatigue decreases as  $D_c$  increases, but the intensity of the cathodic process increases steadily. This causes an increase of  $\sigma_{-1}^N$  to a maximum of  $0.15 \text{ a/dm}^2$  which is 10 % below the corresponding value from the experiment in air. Further increase of  $D_c$  (intensification of the cathodic process and of hydrogen fatigue) and application of an anodic potential causes a decrease in  $\sigma_{-1}^N$ . There are 3 figures.

ASSOCIATION: Institut mashinovedeniya i avtomatiki Akademii nauk USSR  
(Institute of the Science of Machines and Automation of the Academy of Sciences UkrSSR)

PRESENTED: February 6, 1962, by P. A. Rebinder, Academician

SUBMITTED: July 8, 1961

Card 2/2

S/735/61/000/000/006/014

AUTHOR: Babey, Yu.I.

TITLE: The *VMA-30* (*IMA-30*) machine for the endurance testing of metals in working media.

SOURCE: Akademiya nauk Ukrainskoy SSR. Institut mashinovedeniya i avtomatiki. Mashiny i pribory dlya ispytaniy metallov. Kiyev, 1961, 47-53.

TEXT: The design of a machine and accessories for the endurance testing of rotating specimens in pure cyclic bending in liquid and gaseous operational media is described. The specimen is rotated at a constant rpm, and the cyclic bending stresses are induced by a constant force (a weight). The influence of an initial set of the specimen is found to be negligible. The most generally used Soviet machine of this type, the *HY* (*NU*) machine, is limited to specimens 8-12 mm in dia and to operation in air. The new *VMA-30* (*IMA-30*) machine accommodates specimens to 10-30 mm dia and permits tests in air and various media. The machine has two-row self-aligning "1314" ball bearings; the specimen is held in a Morse No. 2 chuck. A single weight exerts an equal transverse force on both ends of the specimen; the machine support exerts a balancing counterforce on the far ends of the specimen-carrying bearings by means of a system of cranks and levers. The specimen is driven by an electric motor via a cord-sheathed rubber flex-shaft. An automobile speedometer serves to count the revolutions. Star-connection during the starting process helps to achieve a smooth acceleration. The starting switch Card 1/2



The VMA -30 (IMA-30) machine for the endurance... S/735/61/000/000/006/014

employs a magnetic relay; the cut-off switch is actuated by the weight-produced transverse force directly upon failure of the specimen. Testing in liquid and gaseous media, including testing for the investigation of cathodic and anodic fatigue processes, employs an accessory previously described in Yatsuk, A.I., et al., *Zavodskaya laboratoriya*, no. 2, 1958. A rubber cylinder, embracing the specimen, is flexibly yet hermetically slipped and clamped onto collars at its two end supports, so that only negligible moments are introduced by the stiffness of the rubber. Ebonite or capron inlet and outlet connectors permit the ambiental medium to be ducted into and out of the rubber cylinder. In tests with externally polarized electrolytes, the gas developed within the rubber cylinder exits into a separator, from which the liquid component returns into circulation. Maintenance of constant temperature and circulation of the electrolyte is essential. In cathode processes the specimen serves as the cathode, a platinum wire affixed to the rubber cylinder and supported by a stiffener rib as the anode. The fastening of the specimen in the chuck is adjusted so that the wobbling of the specimen does not exceed 0.01-0.03 mm (ascertained by slow manual rotation and measurement). The exact distance between the two end clampings of the specimens,  $240 \pm 1.0$  mm, is achieved with the aid of a jig. Computation formulas for the determination of the bending stress from the geometry of the machine and the weight applied to the crank-and-lever system are provided. There are 3 figures and 3 Russian-language Soviet references.

ASSOCIATION: None given.

Card 2/2

ST. PETERSBURG, V. I., B. B. V., No. 3.

Effect of admitting a corroding medium and the access of air on  
the corrosion fatigue strength of steel. Voprosy rab. vved na svets.  
no. no. 2:191-194 1963. (MIRA 17:10)

ACCESSION NR: AT4023777

S/2723/63/000/002/0067/0076

AUTHOR: Karpenko, G. V.; Stepurenko, V. T.; Babey, Uy. I.; Shul'te, Yu. A.;  
Mikhaylov, P. A.

TITLE: Corrosion resistance and fatigue strength of ShKh15 steel after electroslag  
smelting

SOURCE: AN UkrRSR. Insty\*tut mashy\*noznavstva i avtomaty\*ky\*, L'viv. Vliyanie  
rabochikh sred na svoystva materialov (Effect of active media on the properties of  
materials), no. 2, 1963, 67-76

TOPIC TAGS: electroslag steel, electroslag remelting, steel ShKh15, steel corrosion  
resistance, steel fatigue strength, corrosion, corrosion resistance

ABSTRACT: The Institut elektrosvarki im. Ye. O. Patona AN USSR (Instituto of  
Electric Welding) has developed a method of electroslag smelting which is now in wide  
use to decrease the number of nonmetallic inclusions and thus increase the corrosion  
resistance of steel. The purpose of the present paper was to determine the effect of re-  
smelting on contamination of ShKh15 steel with oxides, sulfides, and air bubbles and the  
corrosion resistance and corrosion-fatigue strength of this steel, in both the perlite-  
ferrite and martensite states, in 3% sodium chloride. The results showed that electroslag

Card 1/3

ACCESSION NR: AT4023777

Smelting of ShKh15 steel in the ZMI machine decreased the content of impurities by 2-2.5 units and the porosity at the center by 0.5 units. As shown in the Enclosure, smelting increased corrosion resistance by up to 15% in 3% sodium chloride, but increased it only insignificantly in air. Smelting increased the corrosion-fatigue strength of ShKh15 steel by up to 40% in the martensitic hardened condition and by up to 20% before hardening. However, lowering the quantity of impurities below a certain value did not affect the corrosion and corrosion-fatigue strength of the steel. "The thermal treatment was carried out by F. P. Yanchishin (Cand. Tech. Sci.) and Eng. K. P. Tabinskiy." Orig. art. has: 4 figures, 4 tables and 3 formulas.

ASSOCIATION: Insty\*tut mashy\*noznavstva i avtomaty\*ky\*, AN UkrSSR , Lvov  
(Institute of Machine Technology and Automation, AN UkrSSR)

SUBMITTED: 00

DATE ACQ: 10Apr64

ENCL: 01

SUB CODE: MM

NO REF SOV: 004

OTHER: 000

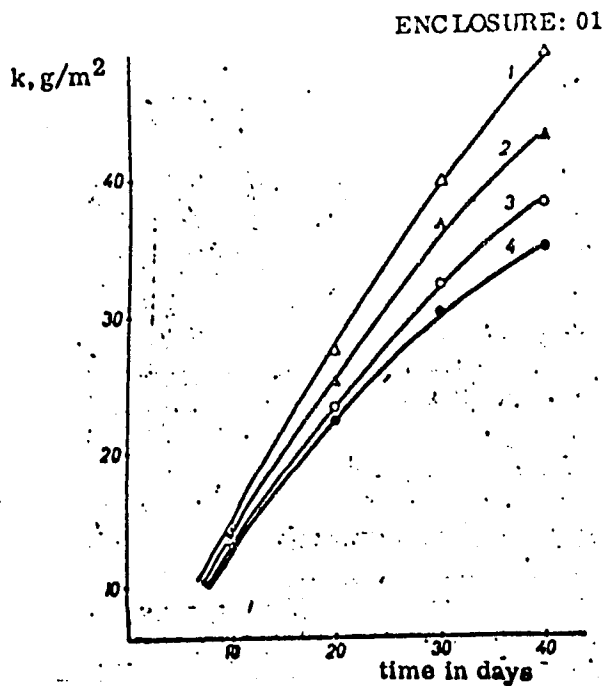
2/3

Card

ACCESSION NR: AT4023777

Fig. 1 - Corrosion losses of steel ShKh15 in relation to time in 3% sodium chloride:

1 - steel from a usual smelt (melt No. 314822), perlite-ferrite; 2 - steel after electroslag smelting (melts No. 18, 28, 33), perlite-ferrite; 3 - steel from a usual smelt (melt No. 314822), martensite; 4 - steel after electroslag smelting (melts No. 46, 48, 53), martensite.



Card

3/3

BABY, Ya. V.; SHCHUPONKO, V. T.; KARVENKO, O. V.

Effect of mechanical working and inherent properties on the corrosion resistance and fatigue strength of steel following its preliminary corrosion. Vifian.rab. sred na svols. mat. no.2:77-86 '63. (MIRA 17:10)

KARPENKO, G.A.; BABY, Y.I.

Effect of mechanical working on the absorption fatigue of steel.  
Vyslan.rab. sred na avtors. mat. no.20108-113-162.

1970  
1970

(MIRA 17:10)

S/021/63/000/003/015/022  
D405/D501

AUTHORS: Karpenko, H. V., Corresponding Member of the Academy of Sciences UkrRSR, Stepurenko, V. T. and Babey, Yu.I.

TITLE: Dependence of corrosion fatigue strength of steel on test conditions

PERIODICAL: Akademiya nauk UkrRSR. Dopovidi. no. 3, 1963, 366-368

TEXT: Corrosion fatigue tests were carried out with the purpose of showing that the endurance limit of steel varies considerably as a function of testing conditions such as the form in which the corrosive medium is supplied, its mixing, and the inflow of air (oxygen). Structural steel 40 of composition 0.37% C, 0.20% Si, 0.72% Mn, 0.073% Cr, 0.02% P, and 0.036% S, was tested for corrosion fatigue on the machine ~~M/И-6000~~(MUI-6000), by pure bending, the specimen revolving in air and in a 3% NaCl solution respectively. The test comprised 5 million load cycles in air and 20 million load cycles in the corrosive medium. By attaching a special device to the testing machine it was possible to carry out the tests under

Card 1/3



Dependence of corrosion ...

S/021/63/000/003/015/022  
D405/D301

the following conditions: In a flowing solution without access of air, in same with access of air, in differently mixed media, by wetting the specimen continuously or periodically. The experiments showed that increased inflow of oxygen (from air) into a corrosive medium, such as a 3% NaCl solution, reduces considerably the endurance of steel; the more intense the medium is mixed, the less the endurance. In tests with distilled water the opposite effect was observed: the greater the inflow of oxygen into the corrosive medium, the higher the endurance of the steel. In corrosion fatigue tests of steel cathode protection (in a 3% NaCl solution) it was found that in a medium at rest it is possible to achieve almost complete protection of steel cathodes, whereas in a moving medium they cannot be protected. On the basis of the obtained results the following recommendations are made: a) Consideration should be made in corrosion-fatigue tests also of the form in which the corrosive medium is supplied, in addition to the other details relating to specimen and medium; b) In corrosion fatigue tests of metals the actual manufacturing conditions should be simulated exactly. There is 1 figure.

Card 2/3

Dependence of corrosion ...

S/021/63/000/003/015/022  
D405/D301

ASSOCIATION: Instytut mashynoznavstva ta avtomatyky AN URSS (In-  
stitute of the Science of Machines and Automation of  
the AS UkrRSR)

SUBMITTED: June 25, 1962

Card 3/3

L 11420-63

EWP(q)/EWT(m)/BDS AFFTC/ASD JD

8/032/63/029/005/010/022

55

AUTHORS: Karpenko, G.V., Stepurenko, V.T. and Babey, Yu. I.

TITLE: On the method of testing metals for corrosion fatigue (8)

PERIODICAL: Zavodskaya laboratoriya, v. 29, no. 5, 1963, 583-584

TEXT: As a rule, in the literature on testing metals for corrosion there are no indications of the access of atmospheric oxygen to the corrosive medium or of the degree of mixing of the medium. The tests made in the present work show that these factors, and the method of application of the corrosive medium to the test piece, have a substantial effect on the results. There is 1 figure.

ASSOCIATION: L'vovskiy institut mashinovedeniya i avtomatiki (L'vov Institute of the Mechanical Engineering and Automation)

ja/CRJ

Card 1/1

L 55857-55 EWT(m)/EPP(c)/EWP(w)/EWA(d)/E/EWP(t)/EWP(b)/EWP(z) MJA/JL/WB

ACCESSION NR: AN5014025

UR/0277/65/000/003/0010/0010  
620.178.3:669-426

25  
B

SOURCE: Ref. zh. Mashinostroitel'nyye materialy, konstruktai i raschet detaley mashin. Gidropriod. Otdel'nyy vypusk, Abs. 3.48.73

AUTHOR: Karpenko, G. V.; Stepurenko, V. T.; Babey, Yu. I.

TITLE: Corrosion fatigue strength of ShKh15 steel after electroslag remelting

CITED SOURCE: Sh. Korrozion. ustalost' metallo<sup>5</sup>, L'vov, Kamenyar, 1964, 105-112

TOPIC TAGS: electroslag remelting, corrosion fatigue, corrosion resistance, impurity content, steel fatigue, saline corrosion / ShKh15 steel

TRANSLATION: The study concerned the effects of electroslag remelting of ShKh15 steel on the content of impurities (oxides, sulfides and globules), as well as on corrosion resistance and corrosion fatigue strength of the steel in a 3% solution

"APPROVED FOR RELEASE: 06/06/2000

CIA-RDP86-00513R000102820013-4

(up to 40%) and normalized (up to 20%) steel. Bibli. with 4 titles.

SUB CODE: MM  
Card 1/1

ENCL: 00

APPROVED FOR RELEASE: 06/06/2000

CIA-RDP86-00513R000102820013-4"

L 55859-65 EWT(d)/EWT(m)/EWP(w)/EWP(v)/EWA(d)/T/EWP(t)/EWP(l)/EWP(b)/EWP(z)/EWP(k)/  
EWP(h)/EPP(c) Pf-4 MJW/JD/WB

ACCESSION NR: AR5014027

UR/0277/65/000/003/0011/0011  
669.14.018:620.194.8

41  
40

SOURCE: Ref. zh. Mashinostroitel'nyye materialy, konstruktsei i raschet detaley mashin. Gidropriwod. Otdel'nyy vypusk, Abs. 3.48.77

AUTHOR: Babey, Yu. I.; Stepurenko, V. T.; Karpenko, G. V.

TITLE: Effect of pre-corroding on the fatigue strength of steel

CITED SOURCE: Sb. Korrozion. ustalost' metallov. L'vov, Kamenyar, 1964, 74-87

TOPIC TAGS: precorrosion treatment, corrosion fatigue, steel corrosion, surface machining, saline corrosion, atmospheric corrosion, steel fatigue, aggressive environment / steel No. 45

TRANSLATION: The study concerned the resistance of variously treated and machined steel No. 45 against atmospheric corrosion and corrosion caused by periodic wetting in a 3% solution of NaCl, as well as the effect of these types of pre-corroding treatment on the subsequent fatigue strength of steel in relation to machining operations. Fatigue tests were carried out on VMA-30 fatigue testers, using  $10 \cdot 10^6$  cycles in air and  $50 \cdot 10^6$  cycles in the corrosive environment as a basis.

Card 1/2

L 55859-65

ACCESSION NR: AR5014027

Roller-burnished steel 45 exhibited the best resistance to atmospheric corrosion or corrosion induced by alternate wetting and drying. Machining of the steel surface by high-speed cutting insured better corrosion resistance than machining by pressure cutting or standard turning. Pre-corroding by alternate wetting in a 3% solution of NaCl and drying improved the corrosion fatigue strength of pressure-cut steel in 3% NaCl, but most strongly reduced the wear in air. The wear resistance of samples machined by high-speed cutting and standard turning was less sensitive to pre-corroding treatment. The corrosion fatigue strength of pre-corroded samples of steel No. 45, machined by high-speed cutting or standard turning, did not vary in an aggressive corrosion environment. Bibl. with 4 titles. I. Potapov

SUB CODE: MM

ENCL: 00

Card 2/2

BABEY, Yu.I.; ROMANIV, O.N.; KARPENKO, G.V.

Effect of torsional cold hardening on the fatigue resistance  
of steel. Vop. mekh. real'. tver. tela no. 2:155-161 '64.  
(MIRA 17:9)



KARPYAEVICH, R.I.; BABY, Yu.I.; LITVIN, A.E.; KACHMAR, D.F.

Effect of cyclic elastic-plastic deformation of steel on its tendency toward brittle failure in neutral electrolytes. Villan. rab. sred na svois. mat. no.3:23-27 '64.  
(MIRA 17:10)

L-23046-65

EWT(m)/EWT(w)/EWA(z)/T/EWP(t)/ENP(b)

MJW/JD

ACCESSION NR: AT4049945

8/2723/64/000/003/0107/0118

AUTHOR: Kuslitskiy, A. B.; Babov, Yu. I.; Serebriyakiy, E. I.; Mizelskiy, V. L.;  
Denisov, A. Ya.; Karpenko, G. V. (Correspondent from the AN SSSR)

~~Electroslag and vacuum refining~~

~~fatigue strength of steel~~

SOURCE: AN UkrSSR. Fiziko-mekhanicheskiy institut. Vliyaniye rabochikh sred na svoysta materialov, no. 3, 1964, 107-116

TOPIC TAGS: steel fatigue strength, <sup>6</sup>hardening temperature, electroslag steel, vacuum smelted steel, steel purity/ Shkh 15 steel

ABSTRACT: This study was prompted by the lack of data concerning the physical and mechanical properties of electroslag steel (see, e.g., B. Ye. Paton, B.I. Medovar, Yu. V. Latash, Stal', no. 11, 1962) and by the inconclusive results

"APPROVED FOR RELEASE: 06/06/2000

CIA-RDP86-00513R000102820013-4

Card 1/2

19

APPROVED FOR RELEASE: 06/06/2000

CIA-RDP86-00513R000102820013-4"

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: MM

NO REF SOV: 020

OTHER: 004

Card 2/2

L 23067-65 ENT(m)/ENP(w)/ENA(d)/T/ENP(t)/ENP(b) MJW/JD/WB

ACCESSION NR: AT4049948

S/2723/64/000/003/0130/0134

AUTHOR: Kuslitskiy, A. B.; Babey, Yu. I.; Serebriyskiy, E. I.; Mizetskiy, V. L.; Borisov, A. Ya.

TITLE: Corrosion resistance and fatigue strength of annealed ShKh15 steel from electroslag and vacuum smelts 23/8+1

SOURCE: AN UkrSSR. Fiziko-mekhanicheskiy institut. Vliyaniye rabochikh sred na svoystva materialov, no. 3, 1964, 130-134

TOPIC TAGS: steel corrosion, steel fatigue strength, steel annealing, saline corrosion, electroslag melting, vacuum melting, steel impurity/steel ShKh15

ABSTRACT: While the physical and mechanical properties of annealed ShKh15 steel are known to a considerable extent, the resistance to fatigue had not yet been sufficiently investigated. Since the work described earlier by the same authors (AN UkrSSR. Fiziko-mekhanicheskiy institut. Vliyaniye rabochikh sred na svoystva materialov, No. 3, 1964, 107-118) indicated that the differences in smelting technology result in variations in the admixture content of the samples, they now investigated the effects of these nonmetallic admixtures on the static hardness characteristics, fatigue strength, and corrosion resistance of various annealed steels. The results show that: 1. ShKh15 steels from  
Card 1/3

L 23067-65  
ACCESSION NR: AT4049948

ordinary, electroslag and vacuum smelts in the annealed state have approximately equal static hardness and fatigue strength in air. 2 in a corrosive medium, double vacuum-smelted steel and pure samples from single electroslag smelts with a subsequent vacuum smelting show the best fatigue properties (see Fig. 1 of the Enclosure). Orig. art. has 2 figures and 2 tables

ASSOCIATION: none

SUBMITTED: 00

ENCL: 01

SUB CODE: MM

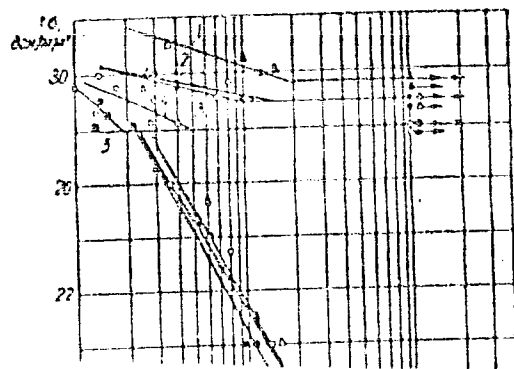
NO REF SOV: 007

OTHER: 000

Card 2/3

L 23067-65

ACCESSION NR: AT4049948



ENCLOSURE: 01

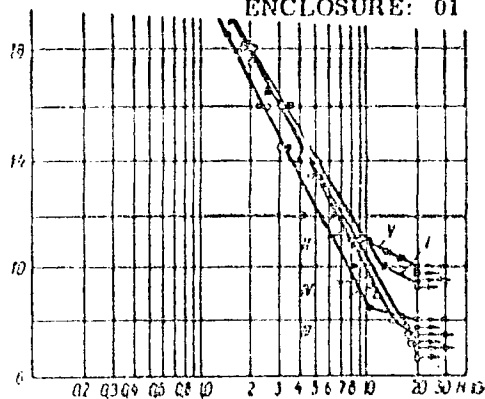


Fig. 1. Fatigue curves of annealed ShKh15 steel of various types, tested in air (Arabic numerals) and in 5% aqueous saline (Roman numerals). 1, I - ShKh15 steel prepared by a single electroslag smelting followed by a single vacuum smelting and containing less non-metallic impurities than in 2/II; 2, II - ShKh15S steel, prepared as in 1, I but containing more non-metallic impurities; 3, III - ShKh15Sh steel prepared by a single electroslag smelting; 4, IV - ShKh15 steel prepared in the usual way; 5, V - ShKh15Ch steel, prepared by double vacuum melting from an especially pure furnace charge.

Card 3/3



L 23065-65 EWP(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(b) JD

ACCESSION NR: AT4049949

S/2723/64/000/003/0135/0142

AUTHOR: Karpenko, I.V.; Babey, Yu. I.

TITLE: Effects of finishing on the fatigue strength of hardened steel

SOURCE: AN UkrSSR. Fiziko-mekhanicheskiy institut. Vliyaniye rabochikh sred na svoystva materialov, no. 3, 1964, 135-142

TOPIC TAGS: steel fatigue strength, hardened steel, surface finish, steel polishing, fine cutting

ABSTRACT: Earlier studies have shown (G. V. Karpenko, Vliyaniye mekhanicheskoy obrabotki na prochnost' i vy'noslivost' stali, K. Mashgiz, 1959) that the fatigue strength of steel, especially under operating conditions, is affected to a considerable degree by the mechanical processing of the surface of the steel parts. However, no data are yet known about the effect of finishing and the processing producing the finishing of hardened steel on the fatigue strength in air and in corrosive media. Consequently, the authors investigated the effects of polishing and fine cutting on the fatigue strength of 40Kh troostite-martensite hardened steel in air and in 3% aqueous NaCl. The basis for the fatigue test was  $10^7$  cycles in air and  $2 \cdot 10^7$  cycles in the NaCl solution. The results showed that polishing of hardened steels after fine cutting produces properties related to the

Card 1/32

L 23065-65

ACCESSION NR: AT4049949

technological inheritance from the preceding mechanical processing. The findings are summarized in Table 1 of the Enclosure. They emphasize the importance of the general "white" layer (due to fine cutting) for the improvement in fatigue strength of hardened steel parts. Orig. art. has: 4 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 01

SUB CODE: MM

NO REF SOV: 003

OTHER: 000

Card 2/3

L 55853-65 EWT(m)/EWP(w)/RPF(c)/EWA(d)/T/EWP(t)/EWP(k)/EWP(b)/EWP(z) PF-4  
ACCESSION NR: AR5014026 UR/0277/65/000/003/0011/0011 MJW/DP/DP 27  
620.194.8:620.14.018 B

SOURCE: Ref. zh. Mashinostroitel'nyye materialy, konstruksii i raschet detaley mashin. Gidroprivod. Otdel'nyy vypusk, Abs. 3. 48.76

AUTHOR: Babay, Yu. I.; Chernyy, V. G.; Karpenko, G. V.

TITLE: The condition of a steel surface after machining and its effect on corrosion fatigue strength 14

CITED SOURCE: Sb. Korrozion. ustalost' metallov. L'vov, Kamenyar, 1964, 172-193

TOPIC TAGS: steel fatigue strength, corrosion fatigue, steel surface, steel machining, high speed machining, pressure cutting / steel No. 45 14

TRANSLATION: The article lists the results of a study of the effects of various machining processes (pressure, standard and high-speed turning, grinding) on the fatigue strength of steel No. 45 in air and in a corrosive environment (3% solution of HCl). Samples machined by high-speed turning showed better fatigue strength in air or corrosive media than samples machined at normal speeds. Pressure cutting reduced fatigue strength sharply and the deterioration of corrosion

Card 1/2

L 55858-65

ACCESSION NR: AR5014026

fatigue strength was even greater. The improved fatigue and corrosion fatigue strengths of samples after high-speed cutting, as compared to the other named processes, is attributed to better physical and mechanical properties of surface layers of the metal, whose effect is greater than that of surface microgeometry. Bibl. with 25 titles; 3 illustrations and 4 tables.

SUB CODE: NN

ENCL: 00

Card 2/2

L 11327-65 EWT(m)/EWP(w)/EWA(d)/EWP(t)/EWP(b) MJW/JD

ACCESSION NR: AP4043731

S/0021/64/000/008/1063/1066

AUTHOR: KARPENKO, G. V. (Corresponding member AN UkrSSR); Kusly'ts'ky'y, A. B. (Kublitskiy, A. B.); Ebay, Yu. I.

TITLE: Effect of the density of electroslag and vacuum-melted ball-bearing, ShKh15 steel on its fatigue strength

SOURCE: AN UkrRSR. Dopovid1, no. 8, 1964, 1063-1066

TOPIC TAGS: ball bearing steel, ShKh15 steel, electroslag melted steel, vacuum melted steel, steel fatigue strength, steel density, steel purity

ABSTRACT: The effect of nonmetallic inclusions and density on the fatigue strength of ball-bearing ShKh15 steel [AISI E52100] has been investigated. The steel was made by: 1) melting in an open electric arc furnace, 2) electroslag melting, 3) electroslag and subsequent vacuum melting, 4) electroslag and subsequent double vacuum melting, 5) double vacuum melting, and 6) double vacuum melting from virgin charge materials. All the steels prepared had a standard chemical composition and a hardness of 61-63 HRC after quenching. Density was measured in quenched and fatigue strength, in annealed specimens.

Card 1/2

L 11327-65

ACCESSION NR: AP4043731

Fatigue tests revealed no definite relationship between the presence of individual nonmetallic inclusions in ShKh15 steel and its fatigue strength. The density-fatigue strength test data show that fatigue strength increases as the steel density increases.

DATA SHOULD BE TAKEN INTO ACCOUNT. ORIG. ATT. NOS: 2 figures and

1 table.

ASSOCIATION: Insty\*tut mashy\*noznavatva ta avtomaty\*ky\* AN URSS (Institute of  
Machine Science and Automation, AN URSS)

SUBMITTED: 16 Dec 63

ATD PRESS: 3100

ENCL: 00

SUB CODE: MM,IE

NO REF SOV: 008

OTHER: 003

Card 2/2

L 19623-65 EPA(s)-2/EWT(m)/EWP(w)/EWA(d)/EWP(v)/T/EWP(t)/EWP(k)/EPA(bb)-2/  
EWP(b) Pf-4/Pt-10 ASD(f)-2/AFMDC/ASD(m)-3 MJW/JD/WB/EM

ACCESSION NR: AP4047507

S/0129/64/000/010/0028/0031

AUTHOR: Karpenko, G. V.; Meverson, I. L.; Bsbey, Yu. I.; Tabinskiy, K. P.; Kuslitskiy, A. D.

TITLE: Corrosion and corrosion fatigue resistance of Kh17N2 and SN3 steels

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 10, 1964, 28-31, and bottom half of insert facing p. 40

TOPIC TAGS: stainless steel, steel corrosion, steel corrosion fatigue, precipitation hardenable steel, Kh17N2 steel, SN2 steel, steel corrosion resistance, steel corrosion fatigue resistance, anticorrosion coating, 302 varnish

ABSTRACT: The corrosion and corrosion fatigue of Kh17N2 (0.12% C, 17.23% Cr, 1.84% Ni) and SN3 (0.09% C, 16.93% Cr, 4.71% Ni, 3.31% Mo) stainless steel have been investigated. Steels were heat-treated to a hardness of 38--40 and 40--42 HRC, respectively. The test results showed that the SN3 steel has a higher corrosion resistance than the Kh17N2 steel, e.g., by 2.5 times in 5% sulfuric acid. The SN3 fatigue strength in air

Card 1/1



L 19623-65

ACCESSION NR: AF4047507

3

is 10% higher than that of the Kh17N2 steel. In a 3% sodium-chloride solution, the fatigue strength of both steels decreases by about the same factor, compared with that in air (see Fig. 1 of the Enclosure) and at  $N = 1 \cdot 10^7$  cycles, is about 2 times lower than that in air. This confirms the absence of a direct relation between the corrosion resistance and the corrosion-fatigue resistance of the metal. The SN1 steel is preferable to Kh17N2 steel for compressor blades working

and SNI steels. Orig. art. has: 2 figures.

ASSOCIATION: Fiziko-mekhanicheskiy institut AN UkrSSR(Physiomechanical  
Institute AN UkrSSR)

SUBMITTED: 00

ENCL: 01

SUB CODE: MM

NO REF SOV: 009

OTHER: 000

Card 2/3

L 19623-65

ACCESSION NR: AP4047507 /

ENCLOSURE: 01

$\sigma$  in  $\text{mm}^2$

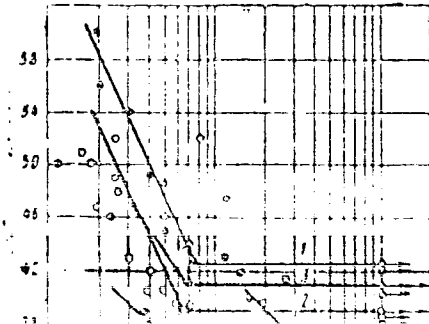
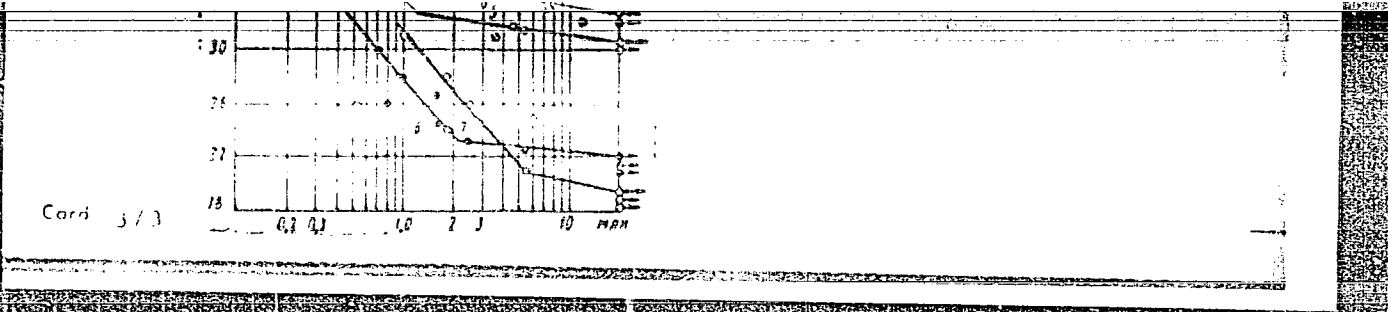


Fig. 1. Fatigue curves of uncoated (1,6) and 302 varnish-coated (4) SN3 steel, and uncoated (2,7) and 302 varnish-coated (3) Kh17N2 steel in air (1,2,3) and in a 3% solution of sodium chlor-



BABEY, Yu. I.

Dynamic analysis of the IMA-30 fatigue-testing machine. Nauch.zap. IMA  
AN URSSR. Ser. mashinoved. 10:108-117 '64. (MIRA 17:10)

L 60256-65 EPP(c)/EWP(k)/EWP(z)/EWA(c)/EWT(m)/EWP(b)/T/EWA(d)/EWP(w)/EWP(t)  
FC-6

ADMISSION NO. AF 5011565

AF 0169 65/001/002/0244/0246

AUTHOR: Pokhmurskiy, V. I.; Boltarovich, A. V.; Babey, Yu. I.

TITLE: The effect of mechanical processing on fatigue strength in Kh17N2 and  
SN-3 steels

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 1, no. 2, 1965, 244-246

TOPIC TAGS: metal mechanical property, fatigue strength, metal physical property,  
stainless steel, steel corrosion

ABSTRACT: Steels of the transitional austenite-martensite class (SN-3) and mar-  
tensite-ferrite steel Kh17N2 undergo certain physical and chemical changes in the  
surface layer during mechanical processing. To show this effect, fatigue tests

Card 1/2

L 60256-65  
ACCESSION NR: AP5012660

25% compared to parts reannealed and finish ground by hand after grinding. Since annealing of K17N2 and SN-3 stainless steels at 450-550°C does not basically change the structure of the metal, but improves certain mechanical characteristics, it is recommended as a finish operation. Identical microgeometry of the surface and physi-



RESULTS OF TESTS OF CYCLO STRENGTH FOR STRENGTH OF THIS CLASS: VARI: DIV: HQ: \*

figure.

ASSOCIATION: FMI AN UkrSSR, Lvov

SUBMITTED: 05Jan64

ENCL: 00

SUB CODE: MM

NO REF SOV: 002

OTHER: 000

Card 2/2 *ljo*

KUSLITSKIY, A.B.; BABBY, Yu.I., KARIMEN, G.V., SHEBENITSKIY, ...  
MIZHETSKIY, V.L.; BORISOV, A.Ya.

Effect of nonmetallic inclusions and metal density on the  
fatigue strength of electric slag and vacuum remelted 18Kh15  
steel. Stal' 25 no.2:151-153 F '66. (MIRA 18:3)

KARPENKO, I.V.; BABY, Yu.I.; KARPENKO, G.V. [Karpenko, I.V.]

Possibility of increasing the corrosion-fatigue resistance of  
hardened steel. Dop. AN URSR no.9:1179-1182 '65.

(MIRA 18:9)

1. Fiziko-mekhanicheskiy institut AN UkrSSR. 2. Chlen-korrespondent  
AN UkrSSR (for G.V.Karpenko).

L 62078-65 SPP(a)/EWP(h)/EWP(z)/EWT(d)/EWT(m)/EW(h)/EWP(b)/T/EWA(d)/  
WF(a)/EWP(v)/EWT(z)/EWT(d) 11-6 RSW 12028

ACCESSION NR: AR5014030

UR/0.77/65/000/003/0011/0011  
669.14.018: 539.434:669.788 30  
b

SOURCE: Ref. zh. Mashinostroitel'nyye materialy, konstruktsii i raschet detaley  
mashin. Gidroprivod. Otdel'nyy vypusk, Abs. 3.48.80

AUTHOR: Kripyakevich, R.L.; Babey, Yu. I.; Karpenko, G.V.

TITLE: Hydrogen fatigue of steel

CITED SOURCE: Sb. Korrozion. ustalost' metallov. L'vov, Kamenyar, 1964, 37-43

TOPIC TAGS: hydrogen fatigue, cathodic polarization, electrolyte agitation, steel fatigue

TRANSLATION: The authors carried out a study of the phenomenon of hydrogen fatigue  
of steel No. 45 in a corrosive environment during cathodic or anodic polarization, using  
samples with  $\sigma_{-20}$  mm in a simple bending test with rotation on an IMA 30 tester.  
A reduction of nominal fatigue strength with time was noted in all cases of cathodic  
protection. An increase in current density within defined limits produced an increase in  
nominal fatigue strength. Cathodic protection failed to restore corrosion fatigue.

strength values to their levels in air when the electrolyte was agitated.

Card 1/1 *ljj*

SUB CODE: MM

ENCL: 00

ACCESSION NR: AR5014035

UR/0277/65/000/003/0030/0030  
620.194.8

30  
3

SOURCE: Ref. zh. Mashinostroitel'nyye materialy, konstruktssi i raschet detaley mashin.  
Gidropriwod. Otdel'nyy vypush, Abs. 3.48.234

AUTHOR: Karpenko, G.V.; Stepurenko, V.T.; Babey, Yu. I.

TITLE: Methodolgy of corrosion fatigue testing of metals

CITED SOURCE: Sb. Korrozion. ustalost' metallov. L'vov, Kamenyar, 1964, 155-161

TOPIC TAGS: steel corrosion fatigue, corrosive medium feed, atmospheric oxygen,  
cathodic shielding, structural steel, fatigue testing, steel passivity

TRANSLATION: The authors investigated the effects of corrosion medium feed pattern,  
agitation of the medium and access of air on the corrosion fatigue of structural steel  
M13 6600 for steady bending tests with rotation in air, a

Card 1/2

L 62072-65

ACCESSION NR: AR5014035

strength in 3% NaCl. Free access of atmospheric oxygen passivates the steel during tests in distilled water, so that its fatigue strength increases when compared with tests in distilled water. The conditions under which experiments on cathodic shielding

of the tested and  
the cycles.

SUB CODE: MM

ENCL: 00

*1/10*  
Card 2/2



POKHMURSKIY, V.I.; BOLTAROVICH, A.V.; BABEY, Yu.I.

Effect of machining on the fatigue strength of Kh17N2 and  
Kh17N5M3 (SN-3) steels. Fiz.-khim. mekh. mat. 1 no.2:244-  
246 '65. (MIRA 18:6)

1. Fiziko-mekhanicheskiy institut AN UkrSSR, L'vov.

L 21923-66 EWA(h)/EWT(m)/T/EWA(d)/EWP(w)/EWP(t) IJP(c) JF IN

ACC NR: AP6014622

SOURCE CODE: UR/0133/65/000/002/0151/0153

AUTHOR: Kuslitskiy, A. B.; Batey, Yu. I.; Karpenko, G. V.; Serebriyskiy, E. I.;  
Mizetskiy, V. L.; Borisov, A. Ya.

53  
50  
8

ORG: none

TITLE: Influence of nonmetallic inclusions and metal density on the fatigue strength  
of electroslag and vacuum remelted ShKh15 steel

SOURCE: Stal, no. 2, 1965, 151-153

TOPIC TAGS: nonmetallic inclusion, bearing steel, steel, electroslag melting,  
vacuum melting, density, steel microstructure, fatigue strength, annealing/ShKh15  
bearing steel

ABSTRACT: Very strict requirements have been set forth as to the purity of ShKh15  
ballbearing steel for manufacturing precision instrument bearings. These requirements  
can only be satisfied by special technology, e. g., by means of vacuum-arc and  
electroslag remelting (VAR and ESR). The degree of purity as to nonmetallic inclusions  
is not the same for different methods of remelting. The metal also differs in density.  
The authors of this paper investigated the relationship of both nonmetallic inclusions  
and density to fatigue strength of ShKh15 steel which was processed by six different  
methods: I and II-ESR+VAR (steel ShKh15P and ShKh15S); III-ESR (steel ShKh15Sh);  
IV--conventional melting in an open arc furnace (ShKh15); V--double VAR of a steel  
smelted from pure charge materials; and VI--double VAR of ordinary billets. As to

Card 1/2

UDC: 669.15

L 21923-66

ACC NR: AP6014622

3

chemical composition, the steel of all the melting methods conformed to GOST 801-60. Nonmetallic inclusions content was measured according to the scale of GhMTU 236-60. Density was measured by hydrostatic weighing of 20 samples from each of three melts (after quenching and low tempering). The samples were fatigue tested by the rotating beam method using an NU machines at 50 cps. Samples for fatigue testing were turned from 18-20 mm annealed rods which were then heated to 840-850 C, oil quenched, and tempered at 150°C for 2 hours. The method used for evaluating contamination of the steels did not make it possible to establish a definite relationship between the content of individual forms of nonmetallic inclusions melted by the different methods and their fatigue limit, but, in general, the fatigue strength was lower for those steels which had a higher inclusion content. Of all the methods used it was found that electroslag remelting yields a denser microstructure and, consequently, a higher fatigue strength. Therefore, density of ballbearing steel should be considered as one of the most important factors of its quality and be rigidly controlled in the production of highly reliable bearings. Orig. art. has: 3 figures and 1 table. [JPRS]

SUB CODE: 11, 13, 20 / SUBM DATE: none / ORIG REF: 010 / OTH REF: 006

Card 2/2 nat

I. 14161-66 EWP(m)/EWP(b)/T/EWP(w)/EWP(t) JD/WB

ACC NR: AP5024784 SOURCE CODE: UR/0021/65/000/009/1179/1182

AUTHOR: Karpenko, I. V.; Babey, Yu. I.; Karpenko, H. V.,--Karpenko, G. V. (Corresponding member AN UkrSSR) 48 B

ORG: Physicomechanical Institute AN UkrSSR (Fizyko-mekhanichnyy instytut AN UkrSSR)

TITLE: The possibilities of increasing the corrosion fatigue strength of hardened steels 48 13

SOURCE: AN UkrSSR. Dopovidi, no. 9, 1965, 1179-1182

TOPIC TAGS: corrosion resistant steel, stress corrosion, fatigue strength, hardening, low alloy steel

ABSTRACT: It was shown that the presence of a solid "white layer" on the surface of hardened steel samples increases their fatigue strength in air and particularly strongly (10 times) in a corrosion medium. Such high corrosion fatigue strength of ordinary medium carbon or slightly alloyed hardened steels with a "white layer" on their surface reveals the feasibility of their use in combined cyclic loads and aggressive media acting on machine parts. Orig. art. has: 2 figures and 1 table. [Based on author's abstract].

SUB CODE: 11/ SUBM DATE: 21Aug64  
Card 1/1

2

ACC NR: AP6009606 SOURCE CODE: UR/0369/66/002/001/0003/0009

AUTHORS: Karpenko, I. V.; Ryabov, B. F.; Lutsiv, M. F.; Babey, Yu. I.

ORG: Physico-Mechanical Institute, AN UkrSSR, L'vov (Fiziko-mekhanicheskiy institut AN UkrSSR)

TITLE: Method for determining axial residual stresses in metal surface layers

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 1, 1966, 3-9

TOPIC TAGS: stress distribution, metal stress, steel / 45 steel, 40Kh steel

ABSTRACT: A method for measuring residual axial stresses in the surface layers of solid cylindrical specimens is presented. It consists of measuring with resistance strain gages the deformations which result during continuous etching of a semi-cylindrical portion of the rod and relating these deformations to the residual stresses. Based on the equations proposed by I. A. Birger (Ostatochnyye napryazheniya, Mashgiz, 1963), an equation for the residual stresses as a function of deformation and etching depth is derived in the form

$$\sigma_{ocr} = - \frac{E}{\left[ \frac{2(r-\delta_i) + \pi y_{\delta_i}}{I_{\delta_i}} l(\delta_i) - \frac{\pi}{F_{\delta_i}} \right] (r-\delta_i)} \frac{d\delta_i}{d\delta_i} + E \int_{\delta}^{\delta_i} A(\delta_{i-1}) \frac{d\delta_i}{d\delta_{i-1}} d\delta_{i-1}$$

Card 1/2

L 40305-66

ACC NR: AP6009606

where

$$\Delta_1 + \Delta_2 + \dots + \Delta_n = \delta_i$$

and

$$I_{\delta_i} = \frac{\pi}{8} [(r - \delta_i)^4 + r^4]; \quad F_{\delta_i} = \frac{\pi}{2} [(r - \delta_i)^2 + r^2];$$

$$y_{\delta_i} = \frac{4[(r - \delta_i)^2 - r^2]}{3\pi[(r - \delta_i)^2 + r^2]}$$

The derivatives  $d\varepsilon/d\delta_i$  can be obtained from the experimental data, using parabolic approximations. The term

$$B = \frac{E}{\left[ \frac{2(r - \delta_i) + \pi y_{\delta_i} l(\delta_i) - \frac{\pi}{F_{\delta_i}}}{I_{\delta_i}} \right] (r - \delta_i)}$$

can be constructed graphically to simplify the calculations. Sample curves of residual stress distributions in 20- and 150-mm diameter rods made of steels 45 and 40Kh are presented to demonstrate the procedure. Orig. art. has: 13 formulas and 4 figures.

SUB CODE: 11,20/ SUBM DATE: 21Sep65/ ORIG REF: 002

Card

*MKP*

ACC NR: AP6029686

(A)

SOURCE CODE: UR/0369/66/002/004/0450/0456

AUTHOR: Babey, Yu. I.; Vasilenko, I. I.; Karpenko, I. V.

ORG: Physics-Engineering Institute, AN UkrSSR, L'vov (Fiziko-mekhanicheskiy institut AN UkrSSR); Physics-Technical Institute of Low Temperatures, AN UkrSSR, Khar'kov (Fiziko-tehnicheskiy institut nizkikh temperatur, AN UkrSSR)

TITLE: The influence of some types of mechanical processing on the stress corrosion cracking of 40-Kh steel (1)

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 4, 1966, 450-456

TOPIC TAGS: corrosion resistant steel, stress corrosion, thermal process, microgeometry

ABSTRACT: Results are presented from an investigation of the influence of the physical-mechanical state of the near-surface layers of metal and microgeometry of the surface of samples on their stress-corrosion cracking as a function of thermal and mechanical processing of the steel. The intensity and nature of the formation of fissures in the metal after these types of treatment is also studied. The studies were performed on steel oil-quenched from 850 C and tempered at 170, 320, 450, and 530 C for 2 hours. The stress-cracking tests were

Card 1/2

ACC NR: AP6029686

performed in 20% H<sub>2</sub>SO<sub>4</sub> with monaxial extension. The types of surface processing were high-speed turning, pressure cutting, and grinding. The experiments showed that the various physical and mechanical states of the near-surface layer of the metal produced by various mechanical processes, even though the microgeometry of the surface was identical, resulted in different resistances to corrosion cracking. High-speed turning increased the resistance of the steel to stress-corrosion cracking over power turning, which leaves residual stresses in the metal. Turning of annealed and low-temperature-tempered steel, creating a solid white layer, sharply increases the resistance to stress corrosion cracking. After etching in an electrolyte, samples processed by high-speed turning showed reduced microirregularities, which cause an increase in resistance to stress cracking of these samples. The final mechanical treatment influences primarily the length of the incubation period of corrosion fissures. The investigation showed that the growth rate of fissures in flat samples in neutral and acid electrolytes was approximately identical and did not depend on the conditions of polarization, whereas the durability of cylindrical samples depends strongly on the pH of the electrolyte and the conditions of polarization. Orig. art. has: 5 figures and 1 table.

SUB CODE: 11/ SUBM DATE: 24Mar66/ ORIG REF: 005/ OTH REF: 002

Card 2/2



ACC NR: AM6027007

Monograph

UR/

*(Honored Scientist USSR; Professor)*

Karpenko, Georgiy Vladimirovich; Babey, Yuliy Ivanovich; Karpenko, Illirik Vital'yevich; Gutman, Emmanuil Markovich

Strengthening of steel by machining (Uprochneniye stali mekhanicheskoy obrabotki) Kiev, Naukova dumka, 1966. 201 p. illus., biblio. (At head of title: Akademiya nauk Ukrainskoy SSR. Fiziko-mekhanicheskiy institut) 2700 copies printed.

TOPIC TAGS: fatigue strength, metal cutting, ~~metal hardening~~, metal machining, metal stress, ~~surface hardening~~, ~~mechanical metal cutting~~, fatigue test, corrosion resistance, corrosion resistant steel, *mechanical heat treatment, rupture strength, steel property*

PURPOSE AND COVERAGE: This book is intended for scientific and engineering personnel working on the strength of machine part. The authors discuss the effect of several methods of machining on the physicomachanical and electrochemical properties of steel. They show that a particular combination of thermal and mechanical treatment, which results in a solid white layer in the surface layers of steel parts, effectively increases the fatigue strength, particularly the corrosion-fatigue strength (10—15 times), of machine parts, as well as their stress-rupture strength in operation under neutrally corrosive conditions. The findings presented are based on

Cord 1/2

ACC NR: AM6027007

studies made at the Physico-Mechanical Institute of the Academy of Sciences, Ukrainian SSR at L'vov during the last several years. Several methods developed at the Institute during the study are described in detail. The results of the study are summarized at the end of the book. There are 111 references of which 92 are Russian.

TABLE OF CONTENTS [abridged]:

Foreword -- 3  
Introduction -- 5  
Ch. I. Effect of cutting rates on the physicomachanical properties of the surface layers of steel -- 10  
Ch. II. Effect of cutting rates on the fatigue and corrosion-fatigue strength of steel and on its corrosion cracking -- 131  
Conclusion -- 185  
Literature -- 198

SUB CODE: 11/ SUBM DATE: 12Feb66/ ORIG REF: 092/ OTH REF: 019

Card 2/2



BAEKA, I, 1951

(Physiol. and Path. Anat. Inst. U. of Budapest.)

"Effects of Degradation Products of Nucleic Acids on the Isolated Frog Heart."

Acta Physiol (Budapest), 1951 2/1 suppl (24-25)

No. abst. in Exc. Med.

GRONOWICZ, Jan; NABIAK, Jerzy

Kazimierz, supplying station for locomotives. (zegl. kolej. mechan. 11  
no. 11:268, 277-283 N 164.

1. Design Office, Central Institute For Research and Development  
of Railway Techniques, Warsaw.

BABIAK, M.

Forgotten corners of Vah Valley. p. 143.  
No. 4, Apr. 1955.

SOURCE: East European Accessions List. (EEAL) Library of Congress.  
Vol. 5, No. 8, August 1956.

GINTAUTAS, A.; STALIONIS, S.; SHLEIKUS, P.; MOZGEVA, T.; BABIANSKAS, M.;  
RIZIULIAVICHUS, S.

Experience in the control of helminthiasis in Kovarsk as District,  
Lithuanian S.S.R.

(KOVARSKAS DISTRICT--WORMS, INTESTINAL AND PARASITIC)

BABBARZ, T.

Remarks on steering with the body during parachute jumping.

p. 14 (Skrzydlata Polska. Vol. 12, no. 32, Aug. 1950. Warszawa, Poland)

Monthly Index of East European Accessions (EEAI) IC. Vol. 1, no. 2,  
February 1953



MAKHMUDBEKOV, B.M., zasluzhennyy deyatel' nauki, prof.; BABIBLI, T.D.,  
kand.med.nauk

Surgical treatment osteoarticular tuberculosis. Azerb. med. zhur.  
no.11:17-22 N '61. (MIRA 15:2)

1. Iz gosptal'noy khirurgicheskoy kliniki (zav. zasluzhennyy deyatel'  
nauki, prof. B.M.Makhmudbekov) Azerbaydzhanskogo meditsinskogo instituta  
imeni N. Narimanova (rektor - zasluzhennyy deyatel' nauki prof.  
B.A.Eyvazov). (BONES\_\_TUBERCULOSIS) (JOINTS\_\_TUBERCULOSIS)

BABIC, B.

"Petrurgy; stone processing by the methods of melting and fiber extracting." p. 133.  
(Kemija U Industriji, Vol. 2, no. 5, 1953, Zagreb.)

SO: Monthly List of East European Vol. 2, No.9  
Accessions,/Library of Congress, September 1953, Uncl.

EAERIC, E.

"Mineral raw materials, world production and reserves," Tehnicki Pregled, Zagreb, Vol 5, No 5/6, 1953, p. 225.

SO: Eastern European Accessions List, Vol 3, No 11, Nov 1954, L.C.



1953, .

New Division of the Upper Silesia: in *Prace*, p. 21.  
POLSKI WIEŚNIK, Zagreb, Vol. 5/7, 1951/53 (published 1954).

SC: Monthly List of East European Accessions, (SAL), LC, Vol. 4, no. 10, Oct. 1955,  
Encl.

BABIC, Bogdan

BABIC, Bogdan, dr.; PERISIC, Milutin, dr.

The problem of cysticercosis of subcutaneous tissue. Srpski arh. celok. lek. 82 no.5:636-638 My '54.

1. Neurohirurška klinika Medicinskog fakulteta u Beogradu;  
upravnik: prof. dr. Slobodan Kostic. (Rad je Urednistvo primilo  
24.XI.1953 god.)

(CYSTICERCOSIS  
\*subcutaneous)

BABIC, Bogdan

Dr. Fran Tucan, September 14, 1878-July 22, 1954; obituary. Geol  
vjes Hrv 8/9:241-246 '54/'55 [publ. '56]

MILENKOVIC, Petar; JANKOVIC, Ivan; BABIC, Bogdan

Unusual case of metastatic adenocarcinoma of the thyroid gland.  
Srpski arh. celok. lek. 84 no.1:102-107 Jan 56.

1. Neurohirurska klinika Medicinskog fakulteta u Beogradu.  
Upravnik: prof. dr. Slobodan Kostic. Radioloski institut  
Medicinskog fakulteta u Beogradu. Upravnik: prof. dr.  
Stojan Dedic.

(CRANIUM, neoplasms  
metastasis to thyroid, case report (Ser))  
(THYROID GLAND, neoplasms,  
metastatic from cranium, case report (Ser))



SRB, B.S.; ATANACKOVIC, V.B.; DJIVANOVIC, B.B.; ~~BAJIC, B.J.~~

Kvashiorkor in Kosmet. Higijena, Beogr. 9 no.2-3:110-124 1957.  
(KWASHIORKOR, epidemiol.  
in Yugosl. (Ser))

BABIG, D.

Yugoslavia (430)

Science - Periodicals

The Iron Gate Fisheries. p. 281\_PRIRODA. (Hrvatsko prirodoslovno drustvo ) Zagreb / Ten no. a year; illustrated popular science magazine issued by the Croatian Society of Natural Sciences/ Vol 39, no 8, October, 1952.

East European Accessions List, Library of Congress, Vol 2, No. 6, June 1953, Unclassified.

BABIC D.

IVANKOVIC, Dragoslav, asist. dr.; BABIC, Dusan, dr.

Operated case of ductus botalli persistens. Srpski arh. celok.  
lek. 82 no.7-8:994-999 July-Aug 54.

1. II Interna klinika Medicinskog fakulteta u Beogradu, upravnik:  
doc. dr. Djordje Brkic.  
(DUCTUS ARTERIOSUS PATENT, surg.)

BABIC, Dusan

Syncope and syncope-like situations in general practice. Med.  
glasn. 11 no.2:52-56 Feb 57.

1. Interna klinika A Medicinskog fakulteta u Beogradu (Upravnik:  
prof. dr. B. Stanojevic).  
(SYNCOPE, ther.  
management in GP (Ser))