

Estimation of residual stress by the method of hardness determination. L. A. Glikman. *Zavodskaya Lab* 5, 63-64 (1956). Preliminary results of a study of the relation existing between the stresses and the hardness of metals (etd. with the aid of the Herbert pendulum) are discussed. (See: 1144)

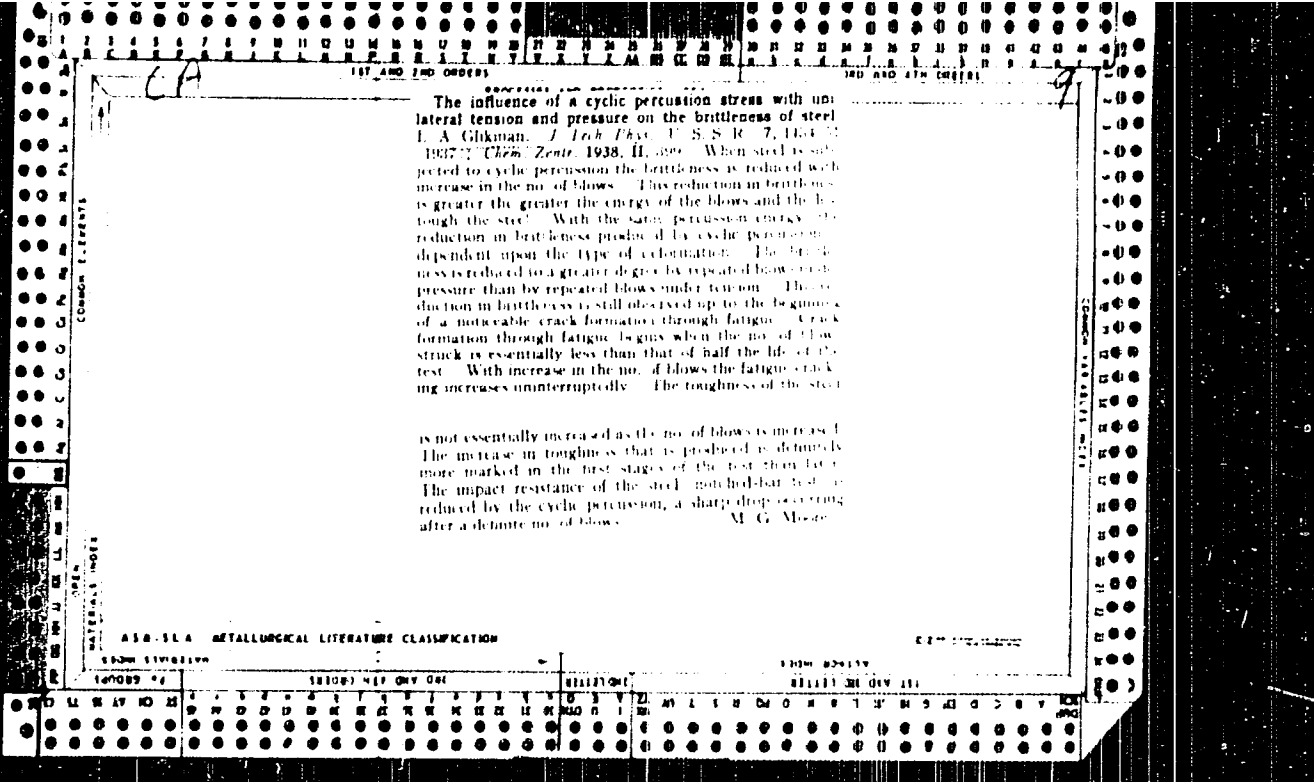
ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

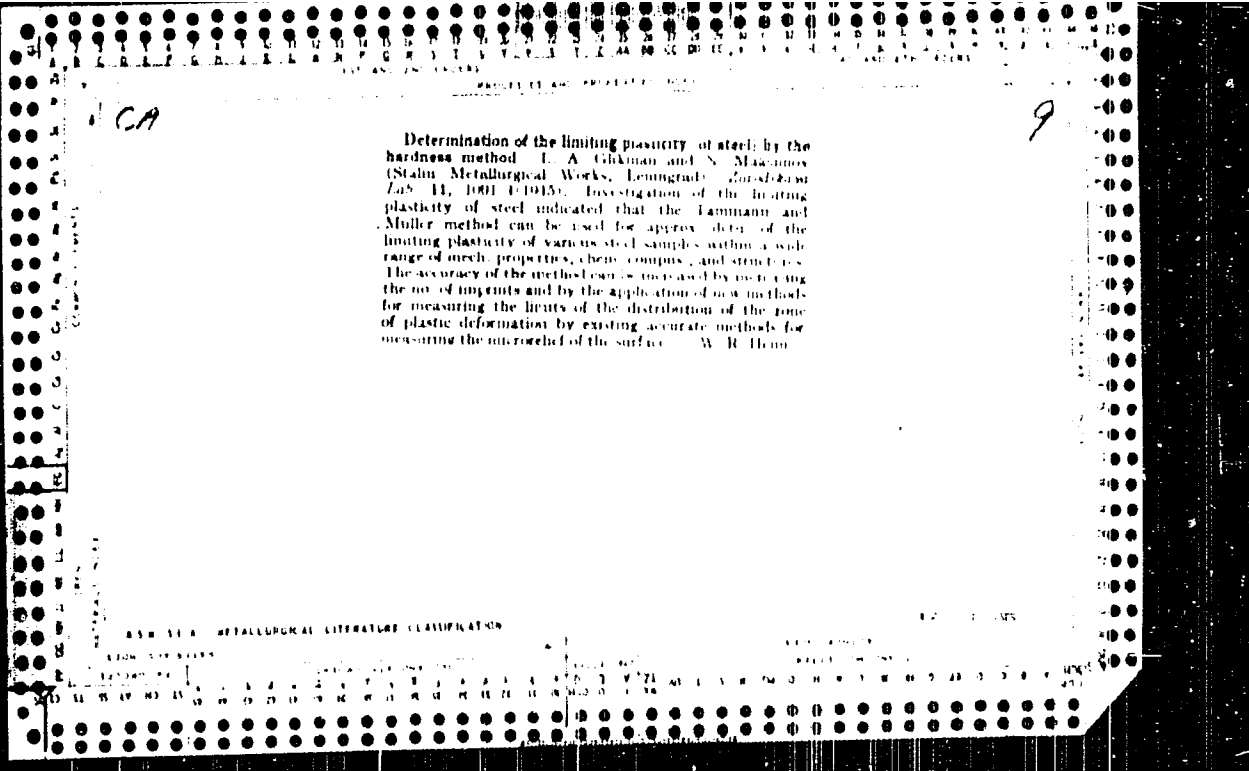
1956-57-58

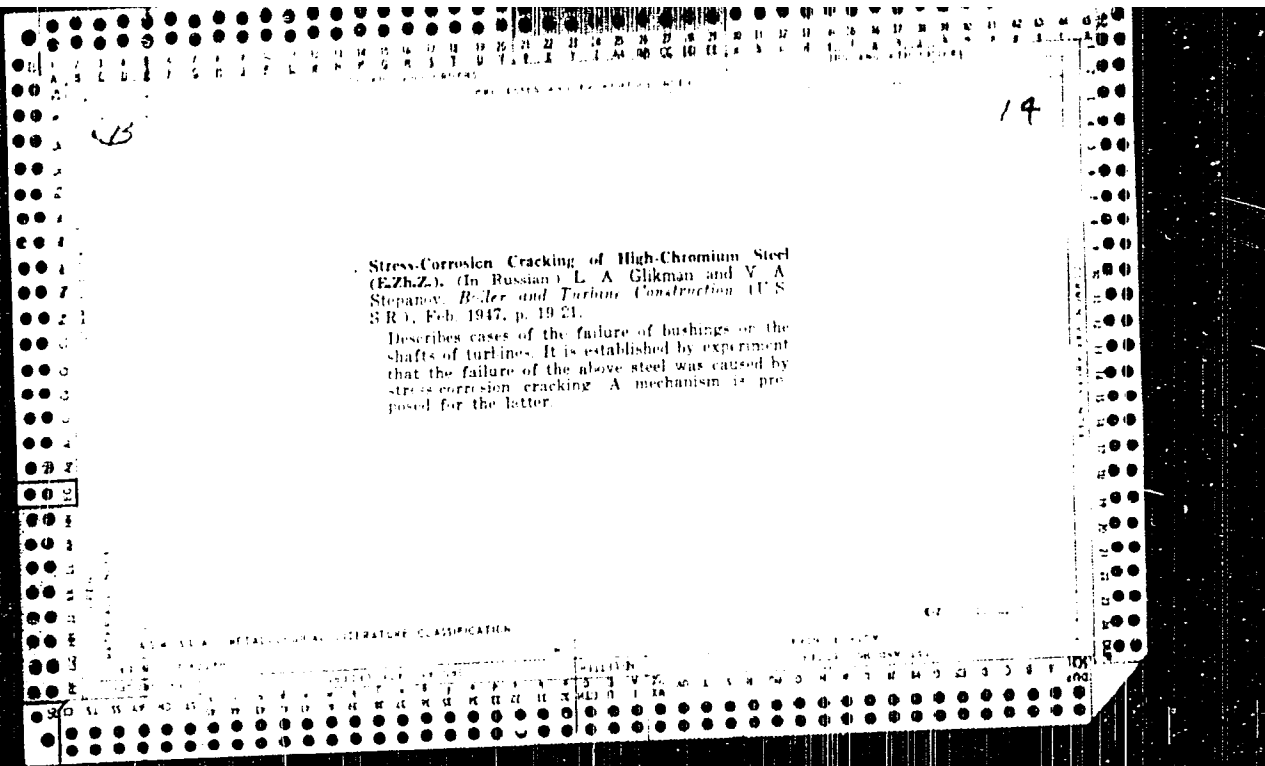
SR 9

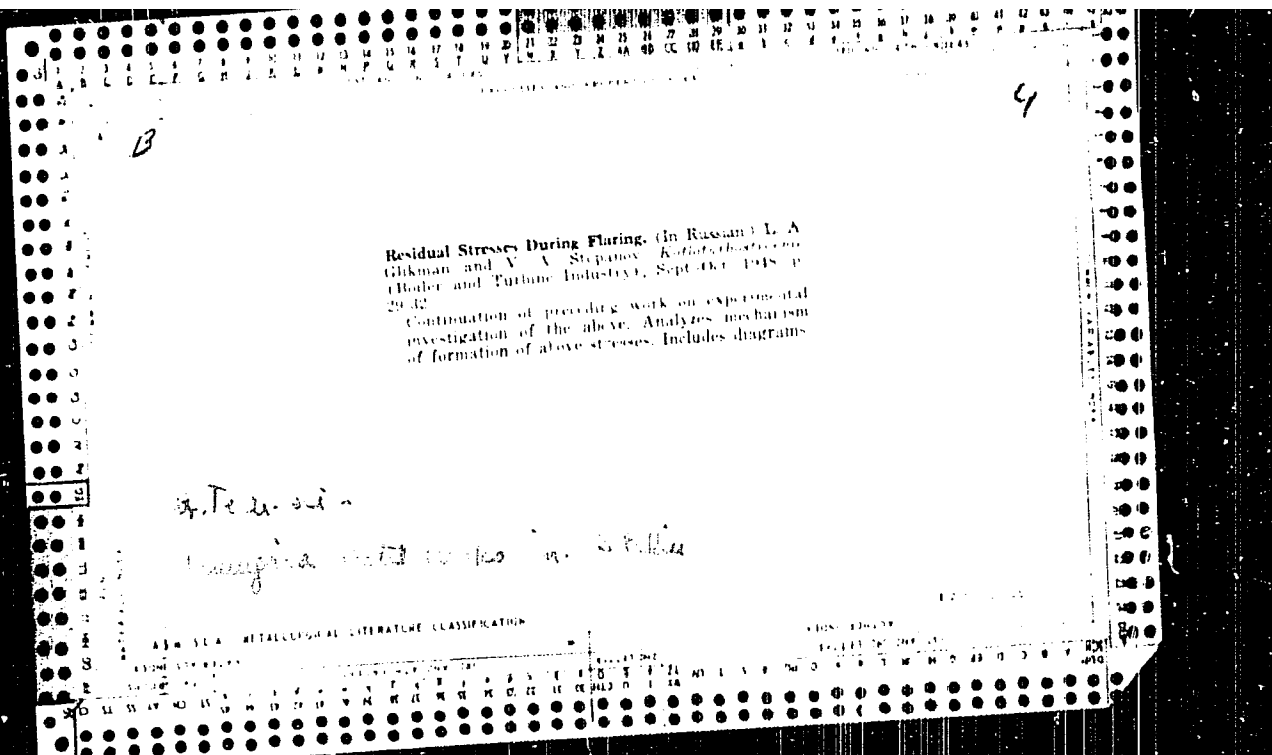
Comparison of the methods of Sachs and MacRae for determining the permanent set in heavy-wall tubes. 1. Chikunov, Zashchita Trub, No. 28, (1946). The method of Sachs (1922, 1931) is considered superior to that of MacRae (Technical Report of Metals 1930). C. B.

ASB 514 METALLURGICAL LITERATURE CLASSIFICATION









USSR/Engineering - Steel, Rolled
Strength of Materials

Oct 49

"Isotropy of Rolled Steel in Relation to Its Tendency
Toward Brittleness," L. A. Giltman, Ye. M. Shevandin,
10 3/4 pp

"Zaved Lab" Vol XV, No 10 1971-1972

Cold brittleness found to be practically identical
for longitudinal and cross-sectional specimens of two
steels for three conditions of heat treatment and
three types of notches, regardless of impact strength.
Additional tests conducted with six more steels.
Observed deviation, however, when interyieldabilization

152122

Oct 49

USSR/Engineering - Steel, Rolled
(Cont'd)

occurred, causing longitudinal specimens to be
less brittle than cross-sectional ones.

152122

JDD

SHAW, I. A.

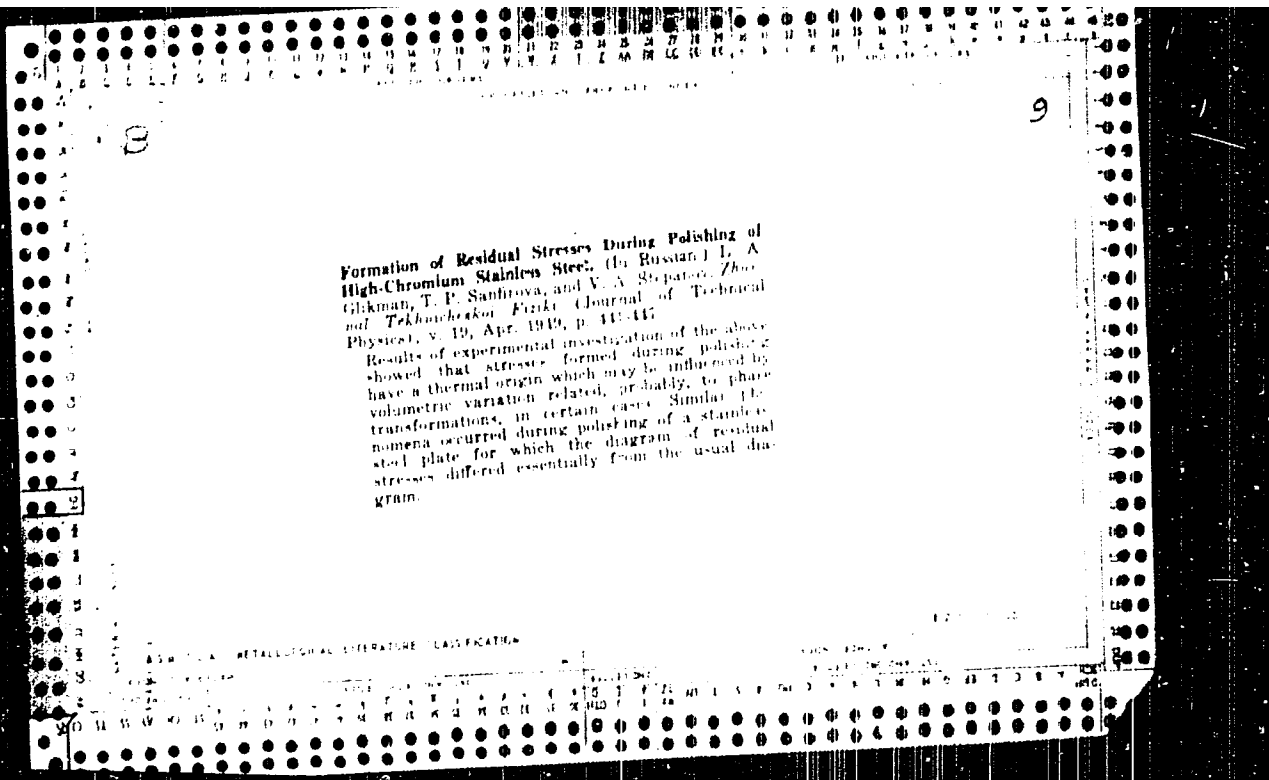
13

Formation of Residual Stresses of the First Order
 During Tensile Stress. II. Problem of the Presence of
 a Weakened Surface Layer. (In Russian) L. A. Glik
 man, T. P. Sanbrova, and V. A. Stepanov. *Zhurnal
 Tekhnicheskoi Fiziki* (Journal of Technical Physics),
 v. 19, Mar. 1949, p. 327-335.

The above was studied using an accurate method
 of testing on various shapes of test specimens.
 The appearance of residual stress during testing
 of specimens of carbon steel above their yield point
 was established. By analysis of the results (tabu-
 lated and charted), the existence of thin weakened
 surface layers was established.

Handwritten: *Литература по теме: остаточные напряжения*

INTERNATIONAL LITERATURE CLASSIFICATION



Variation of Damping Under Cyclic Stresses Below and Above the Fatigue Limit. (The Problem of the Physical Nature of Fatigue.) (In Russian.) L. A. Glikman, V. A. Zhuravlev, and T. W. Sviridov. *Zhurnal Tekhnicheskoi Fiziki* (Journal of Technical Physics), V. 19, Apr. 1949, p. 417-418.

The above was investigated using a specially designed apparatus for two 1% carbon and one high-Cr stainless steel at different stress amplitudes above and below the fatigue limit. The behavior of intermediate aging and annealing on the above variations indicated. Data are tabulated and charted. 15 refs.

2553* The Research of G. V. Uzhik in the Fields of Strength and Plasticity. (In Russian.) E. A. Glikman, N. N. Davidenkov, S. V. Serotich, Ya. B. Fridman, N. A. Shaposhnikov, N. P. Shepov, and Ya. I. Yagin. *Izvestiya Akademii Nauk SSSR (Bulletin of the Academy of Sciences of the USSR, Section of Technical Sciences)*, Nov. 1950, p. 1709-1715.

Analyzes theoretical bases of Uzhik's work on determination of tear resistance and indicates fallacies in his assumptions. Also attempts to show that Uzhik's theories of strength and plasticity are unfounded. The entire article is in answer to Uzhik's refutation of previous criticisms of his work. 25 ref.

GLIKMAN, L. A.

USSR/Metals - Stress

May 51

"Effect of Cold Working on Fatigue Limit of Steel,"
L. A. Glikman, N. N. Davidenkov

"Zhur Tekh Fiz" Vol XXI, No 5, pp 573-577

Examd effect of compressive plastic deformation on
fatigue limit of EZh-1 steel with high chromium con-
tent. According to theory of orientative effect of
micro-defects, one should have expected drop of
fatigue limit. Instead found a rise reaching 13.5%.
Submitted 1 Oct 50.

LC

182T100

GUSEL'SHCHIKOV, M.K., professor; GLIKMAN, L.A., redaktor: Flaum, M.Ya.,
tekhnicheskii redaktor.

[Effect of mechanical and thermal factors on the strength of
marine boilers] Vliianie mekhanicheskikh i termicheskikh vozdeist-
vii na prochnost' sudovykh kotlov. Moskva, Izd-vo "Morskoi transport,"
1952. 55 p. [Microfilm] (MIRA 7:10)
(Steam boilers, Marine)

GLIKMAN, L. A.

USSR/Metals - Anomalous Extinguishment Feb 52

"Anomalous Variation of Extinguishment of Steels
With Low Carbon Content During Rising Temperature,"
L. A. Glikman, K. V. Shishokina

"Zhur Tekh Fiz" Vol XXII, No 2, pp 300-307

Attempts to clarify phys nature of specified prob-
lem. Phenomenon is particularly conspicuous in
temp range 50-150°C with a max at 100°C. It is
assumed that anomalous variation of decrement is
connected to diffusion processes of Ni-atoms, dis-
solved in alpha-iron. Indebted to N. N. Daviden-
kov. Received 31 Jul 51.

209187

1. GLIKMAN, L. A., TEKHT, V. P.
2. SSSR (600)
4. Metals-Fatigue
7. Physical nature of the fatigue process.
Dokl. AN SSSR 86 No. 4, 1952

Carbon steel 35 and stainless steel Zh-2 were investigated by method of V. I. Iveronova and T. P. Kostetskaya (see Zhur. Tekh. Fiz. 10, 4, 1940) using radiograms due to cobalt and chromium rays, which produced interference pattern on film and showed distortion of atomic lattice at deformation. Fatigue is a process similar to that occurring at deformation and is due to "weakened" grains. Presented by Acad I. P. Bardin 5 Aug 52.

252Tkh

9. Monthly List of Russian Accessions, Library of Congress, February 1953. Unclassified.

USSR

Effect of chromium plating on the damping decrement.
L. A. Glikman, M. M. Puzosvika, and A. N. Burzhikov,
Zhur. Tekh. Fiz. 33, 464-70 (1963).—A bright layer (0.12
mm.) of Cr on steel increased the abs. value of the logarithmic
decrement by 0.4-0.6%. The abs. increase of decre-
ment was independent of the amplitude of the voltage.
Decrease in the thickness of the Cr layer decreased the damp-
ing increment. At 500°, the damping of Cr-plated samples
was practically the same as for unplated samples. The
steels studied were: 30KhMA (C 0.33, Cr 1.1, Mn 0.23%);
21N5A (C 0.2, Si 0.3, Mn 0.37, Cr 0.13, Ni 4.6%); Zh-1
(C 0.14, Cr 12.32%); Zh-3 (C 0.21, Cr 13.35%); EI128
(austenitic) (C 0.4, Si 0.55, Mn 0.5, Cr 13.89, Ni 36.85, W

2.41%). The damping decrement was recorded photoelectrically.
A. P. Kotichy

GLIKMAN, L., doktor tekhnicheskikh nauk; ZOBACHEV, Yu.

Ways of increasing the life of ship propellers. *Mor. i rech. flot*
14 no. 4: 20-22 Ap 1954. (MLHA 2:5)
(Propellers)

GLIKMAN, I. A.

FD 361

USSR/Physics - Oscillations in Metals

Card 1/1

Author : Glikman, I. A. and Kheyn, Ye. A.

Title : Effect of cold hardening and aging on attenuation of oscillations of low-carbon steel

Periodical : Zhur. tekhn. fiz. 24, 400-411, Mar 1954

Abstract : Effect of cold hardening on variation of attenuation, related to amplitudes of stresses was investigated by stretching specimens to elongation of 2 to 12.5% and subsequent heating within 100-650° C. The obtained results confirm assumptions that attenuation is affected by two types of processes: diffusional and local plastic deformation.

Institution :

Submitted : October 14, 1953

PHYSICS, I. . .

FB 379

USSR/Physics - Oscillations in Metals

Card 1/1

Author : Glikman, L. A., Kheyn, Ye. A.

Title : Effect of cold working and aging on attenuation of oscillations of copper. II

Periodical : Zhur. tekhn. fiz. 24, 560-565, Mar 1954

Abstract : Studies attenuation of copper in the range of stress amplitudes from 0.05 to 1 kg/sq mm. Effect of cold hardening by tension was investigated on round specimens at degrees of plastic elongation from 1.5 to 28% with subsequent heating in the 100-400° C range. Concludes that in general effect of cold hardening and aging on attenuation of copper is similar to the effect of the same factors on attenuation of low-carbon steel, except changes in attenuation at stress amplitudes close to zero. Diagrams.

Institution :

Submitted : October 14, 1953

GLIKMAN, L.A., doktor tekhnicheskikh nauk; ZOBACHEV, Yu.Ye., inzhener.

Ways to increase the life of a ship's propeller shaft.
Trudy TSNIIRF no.28:3-44 '54. (MLRA 9:1)

(Shafts and shafting) (Corrosion and anticorrosives)

GLIKMAN, L.A., doktor tekhnicheskikh nauk; TERKHT, V.P., kandidat tekhnicheskikh nauk; ZOBACHEV, Yu.Ye., inzhener.

Problem of the physical nature of cavitation breakdowns. Trudy TSNIIRF no.28:45-59 '54.

(Cavitation) (Metallography)

GLIKMAN, L.A.; BOGORAD, L.Ya.; SUPRUN, L.A.; GAKMAN, E.L.; ZHUKOVA, V.I.,
inzh.; red.; FREGER, A., tekhn.red.

[The effect of chrome plating on fatigue and corrosion resistance
of steel] Vliianie khromirovaniia na ustalostnuiu i korrozionno-
ustalostnuiu prachnost' stali. Leningrad, 1955. 9 p. (Leningradskii
dom nauchno-tekhnicheskoi propagandy. Informatsionno-tekhnicheskii
listok, no.84(772)) (MIRA 10:12)

(Chromium plating)

GLIKMAN, L.A.; DAVIDENKOV, N.N., retsenzent; SKORCHELLIPTI, V.V., kandidat
tekhnicheskikh nauk, redaktor; POL'SKAYA, R.G., tekhnicheskij redaktor

[Mechanical strength and corrosion resistance of metals] Korroziionno-
mekhanicheskaja prochnost' metallov. Moskva, Gos. nauchno-tekhn. izd-
vo mashinostroit. lit-ry, 1955. 174 p. [Microfilm] (MLRA 8:2)

1. Deystvitel'nyy chlen AN USSR (for Davidenkov).
(Strength of materials) (Corrosion and anticorrosives)

GLIKMAN, L.A., doktor tekhnicheskikh nauk, professor; SUPRUN, L.A.,
inzhener.

Effect of cathode polarization with protector, and external currents on an increase of fatigue strength under corrosion. Metaloved. i obr.met. no.6:10-15 D '55. (MLRA 9:3)

1. Tsentral'nyy nauchno-issledovatel'skiy institut morskogo flota.
(Corrosion and anticorrosives) (Metals--Testing)

FD-300

USSR/Physics - Cavitation

Card 1/1 Pub. 195 - 14/23

Author : Glikman, L. A.; Teicht, V. P.; Zebachev, Yu. Ye

Title : Problem of the physical nature of cavitation destruction

Periodical : Zhur. Mash. Fiz., 29, February 1955, 200-210

Abstract : The authors state that although there are many works (G. G. I. M. Netzer, Usp. Fiz. Nauk, 32, No 2, 1948; I. M. Vainshteyn, Korroziiya i eroziya sudovyykh gребnykh vintov (Corrosion and erosion of ship's screw propellers), Ship Industry Press, 1949; M. G. Kornfeld, Uprugost' i pruchnost' zhidkostey (Elasticity and stability of fluids), GITML, 1954; V. A. Konstantinov, Dokl. AN SSSR, 4, No 3, 1947) there are no generally accepted ideas as to the physical nature of cavitation destruction and as to the mechanism governing the occurrence of this process. They present new experimental data in an investigation of the surface layer of specimens subjected to cavitation action in a liquid circulation vibrator in initial or earlier stages of destruction. They suggest a theory of cavitation destruction based on the analysis and interpretation of experimental data.

Card 2/2

FD-304b

Abstract : namely on various steels, brass, and nonferrous alloys. They claim that their results permit sharpening existing concepts of cavitation destruction; they present photographs and detailed conclusions (e.g. establishment of plastic deformation in the surface layer etc.). Nine references: e.g. I. A. Glikman, *ibid.*, 7, 14, 1934, 1957.

Institution : -

Submitted : May 16, 1954

17 1957-17-19917

Translation from: Referativnyy zhurnal, Metallografiya, 1957, Iss. 1, p. 99, USSR.

AUTHORS: Glikman, I. A., Zolotarev, Yu. Ye.

TITLE: The Effect of Cathodic Polarization (Achieved by Means of an External Current and in Mg Protection) on the Cavitation Stability of Carbon Steel in Tests Performed on a Magnetostriction Vibrator. (i.e. the Problem of the Physical Nature of Cavitation) [Vliyaniye katodnoy polarizatsii, ynesheniya toki i magniyevyim protektorom na kavitatsionnuyu stoykost' ugletodorostali pri ispytani na magnostriksionnom vibratore, kak vopros o fizicheskoy prirode kavitatsionnogo razruheniya]

PERIODICAL: Tr. Tsentr. n-ti in-ta morsk. Ikht. 1956, No. 5, pp. 1-7

ABSTRACT: The testing of annealed carbon steel (0.25 percent C) was carried out in a magnetostriction vibrator, in which the specimen was caused to vibrate with an amplitude of 76 μ at a frequency of 8000 cps, in sea water (Black Sea composition) and also for the sake of comparison in tap water. The loss in weight was taken as the criterion of cavitation stability. During cathodic polarization (P) the current density was held in the range between 0.6 and 4.2 amp/cm². In addition, tests were also carried

Card 1/3

137 1987-11 15012

The Effect of Cathodic Polarization, Accomplished by Means of (cont.)

out under conditions of anodic I; graphite served as the material for the anode. It was established that, with increased density of the cathodic current, the rate of cathodic break down (CB) is considerably lowered, but that at maximum current densities the weight loss in sea water is very significant and that it comprises approx. 70 percent of the weight lost in fresh water during CB. The large extent of CB, approaching the value for corrosion resistant materials with approximately identical mechanical properties, points to the great importance of the mechanical aspect. Results obtained also reveal the relatively high corrosion losses during CB, which can also be explained by the mechanical aspect. The mechanism of this process consists in the appearance of cyclic plastic deformation (PD) in individual microvolumes, which is a result of the mechanical action of recurrent single impacts. The PD results in a considerable electrochemical non-homogeneity, the primary condition for which is the simultaneousness of the PD process and the action of the medium. The electrochemical non-uniformity is also intensified by microscopic regions of a PD which does not occur simultaneously throughout the area subjected to cavitation. It is shown that the employment of Mg protectors restores the fatigue strength of specimens sub-

Card 2/3

1. Steel-Cavitation-Test results
2. Polarization-Applications
3. Magnetostriction-Applications
4. Vibrating mechanisms-Applications

The Effect of Cathodic Polarization, Accomplished by Means of (cont.)

subjected to simultaneous corrosive action of salt water to 90 percent of its value in air. The fact that Mg protectors have an effect upon CB is an indication that electrochemical non-homogeneity is considerably greater in CB than it is in a fatigue process. At greater current densities the anodic P process resulted in a significant acceleration of the CB owing to the anodic dissolution of specimens being tested.

L. G.

Card 3/3

Reference 104

1987 [1987] 8118

Translation from: Referativnyy zhurnal, Metallurgiya, 1987, Nr 1, p 55 (USSR)

AUTHORS: Glikman, L. A., Babayev, A. N.

TITLE: Effective Application of the Zak's Method in Determining Residual Stresses in Solid and Hollow Cylinder. (Effektivnoye primeneniye sposoba Zaka pri opredelenii otkrytykh napryazheniy v sploshnykh i oboychykh tsilindrakh)

PERIODICAL: Tr. Tsentr. n. i. in. t. morsk. flot., 1986, Nr 5, pp 17-19

ABSTRACT: The application of a modified Zak's method is described which is employed in determining a complete characteristic diagram of the residual stresses (RS) in a cylinder (disc) by means of successive boring and turning. Also described are the results of a comparison of magnitudes of deformation, measured by means of an optical gage and wire strain gages (SG). The procedure presented for the calculation of the RS, in the case of the successive employment of boring and turning operations, does not introduce any significant additional complications, as compared with the usual RS computations according to the Zak's method. It is shown theoretically that preliminary boring results in the removal of the RS in the remaining part of the cylinder, of axial RS that are constant

Card 1/3

1957-11-28-10

Rational Employment of the Zaks' Method (cont.)

over the cross section and varying tangential and radial stresses. Experimental work was performed on discs (D) 105 mm in diameter and 15 mm thick, made of grade 3 steel taken from cylindrical blanks 600 mm long and 110 mm in diameter. RS were induced in the blanks by heating them to a temperature of 650° and keeping them at that temperature for five hours; this was followed by quenching in water in a vertical position. S D's were cut from the center portion of the blank and, for purposes of comparison, several of them were investigated by the usual Zaks' method by determining deformation from a measurement of the outer diameter by means of a horizontal optical gage. It is shown experimentally that SG's are as accurate as the optical gage and that they simplify considerably the process of measuring deformations and determining RS in large cylinders. It is pointed out that the Zaks' method for the determination of a complete RS curve may be employed expeditiously on a single D by successively removing layers of material - first by boring and then by turning. In that instance, a complete RS curve is obtained by interpolating the stresses in the internal zone. Application of the modified Zaks' method should be particularly considered in those cases where the RS curves in the outer layer of a cylinder (direct) or in both

Card 2/3

1971-1972-1973

Rational Employment of the Zalks' Method (cont.)

the outer and inner layers of a solid cylinder, are characterized by a large RS gradient

1. G

1. Cylinders-Stresses-Determination

Card 3/3

Glikman, L. A., Suprun, L. A.

137-58-1-1316

Translation from Referativnyy zhurnal, Metallurgiya, 1958, Nr 1, p 176 (USSR)

AUTHORS: Glikman, L. A., Suprun, L. A.

TITLE: On the Development and Mechanism of Corrosion Fatigue Damage
(K voprosu o razviti i mekhanizme korrozionnoustalostnogo razrusheniya)

PERIODICAL: Tr. Tsentr. n.-i. in-ta morsk. flota, 1956, Nr 5, pp 25-31

ABSTRACT: The problem of the laws of initiation and development of cracks (C) in fatigue failure (FF) of steel subjected to corrosion testing simultaneous with cyclic testing over definite periods of time was investigated at various stress amplitudes. Specimens of Nr 35 carbon steel, previously heat treated by normalization from 850° and subsequent high-temperature tempering at 650°C, were tested. The corrosion medium was fresh water and 3% NaCl solution. It was found that under conditions of corrosion fatigue damage the duration of cyclic testing to the time of appearance of visible C was considerably less than in the FF of steel under ordinary atmospheric conditions. With a 3% NaCl solution, the incubation period for the initiation of C was about 10% of the total number of cycles required for failure, while

Card 1/2

137-58-1-1316

On the Development and Mechanism of Corrosion Fatigue Damage

with fresh water it was about 40% and in atmosphere air about 70-90% of the total time required for FF. This distinctive characteristic of the development of fatigue C is explained by the large number of C in the zone of identical stresses normally observed in addition to the fracture in cases of corrosion FF. The speed of spreading of C once started into the depth of the material increases with an increase in stress amplitude and with an increase in the total number of cycles and also with increase in the corrosiveness of the medium. It is shown that preliminary "exercising" of the specimens in air by cyclic testing for 10 million cycles at a level approaching the σ_w (stress amplitude 27 kg/mm²) increases their corrosion fatigue strength by approximately 30%. This confirms the hypothesis that a developing electrochemical inhomogeneity in the preliminary cyclic testing has a considerably smaller effect on the course of the process of corrosion than does the effect of electrochemical inhomogeneity developing when corrosion is present at the same time.

L. U.

1. Steel--Fatigue
2. Steel--Corrosion
3. Steel--Test methods
4. Steel--Test results

Card 2/2

137-58-1-1317

Translation from: Referativnyy zhurnal. Metalurgiya. 1958. Nr 1. p 176 (USSR)

AUTHORS: Glikman, L. A., Suprun, L. A.

TITLE: The Effect of Surface Hardening by Shot Blasting on the Corrosion Fatigue Strength of Steel (Vliyaniye poverkhnostnogo uprochneniya drobestruynoy obrabotkoy na korroziionnoustalostnyu prochnost' stal.)

PERIODICAL: Tr. Tsentr. n. i. in-ta morsk. flota. 1956, Nr 5, pp 32-35

ABSTRACT: An investigation was made into the effect of shot blasting on fatigue strength (FS) and corrosion fatigue strength (CFS) of specimens of Nr 35 steel that had undergone prior heat treatment. It was found that shot blasting conducted by any of the procedures in current practice, fully approved for standard fatigue testing, retains a favorable influence for corrosion strength in a 3% NaCl solution only over a limited range of cycles (about 2×10^6 cycles). Good protective properties have been demonstrated by a combined protection afforded by shot blasting and by Mg cladding: the CFS proved to be 7% higher than even the FS under atmospheric conditions. From this it follows that to increase the FS of steel products operating under

Card 1/2

137-58-1-1317

The Effect of Surface Hardening (cont.)

the simultaneous effects of variable stresses and corrosion, surface hardening must be applied only in combination with other methods of protection (coatings, or cladding or cathodic protection).

L.U.

1. Steel--Heat treatment
2. Steel--Corrosion
3. Steel--Fatigue
4. Steel--Hardening--Effects

Card 2/2

С. ГЛИКМАН

137-58-1-1335

Translation from Referativnyy zhurnal Metallurgiya 1958, Nr 1, p 186 (USSR)

AUTHORS: Glikman, L. A., Suprun, L. A., Bogorad, L. Ya., Gakman, E. L.

TITLE: Effect of Chromium Plating on the Fatigue and Corrosion
Fatigue Strengths of Steel (Vliyaniye khromirovaniya na ustoi-
lostnuyu i korroziomoustalostnuyu prochnost' stali)

PERIODICAL: Tr. Tsentr. nauch.-issled. in-ta morsk. flot, 1958, Nr 5, pp 36-42

ABSTRACT: The results of an investigation of the effects of the chromium plating procedure employed upon the fatigue strength (FS) and the fatigue corrosion strength (FCS) of specimens of Nr 35 carbon steel subjected to heat treatment are presented. When tested for FCS the midsection of the specimen was in a flowing liquid medium (3% NaCl). Seven chromium platings, differing as to plating procedure and the condition of the Cr coating, were tested. The chromium plating % of all the specimens was performed in a bath with an electrolyte of identical composition (in g/l): CrO_3 150, H_2SO_4 1.5. It was found that C differs in its effect upon FS when tested in air, depending on the plating procedure. For specimens coated with bright and cloudy Cr, significant diminution in the FS of the parent metals was found.

Card 1/2

137-58-1-1395

Effect of Chromium Plating on the Fatigue

which is explained by the presence in the coating of residual tensile stresses, and the positive effect of tempering at 550-600°C was confirmed, as it restored the FS almost completely. In porous chromium plating, no reduction in FS was revealed, and this is explained by the significantly diminished magnitude (due to general development of a network of cracks) of residual tensile stresses in such coating. Corrosion fatigue tests showed that C provides unsatisfactory protection against reduced FS of steel under conditions of corrosion. Tempering after C has virtually no effect on the FCS of steel; all tests revealed a comparatively small difference between the curves for corrosion fatigue of C and of non-chromium-plated specimens. A strict relationship between the corrosion strength and the number of cycles was found to exist in both categories. The use of a supplementary 2-layer Ni and Cu coating beneath the Cr does not improve the protective properties of the coating. A significant improvement in the protection against reduction in FS against corrosion of specimens covered by bright Cr was attained only with a preliminary two-hour heating of the chromium-plated specimens in flaxseed oil at 140-150°. In the opinion of the authors, the unfavorable effect of Cr coatings upon the FCS of steel is explained by the appearance of cracks in the coating under cyclic loads, these cracks serving as channels leading the corrosive medium to the parent metal.

Card 2/2

L. U.

1. Steel-Fatigue 2. Steel-Corrosion 3. Chromium plating-Effects

SOV/124-58-3-3518

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 3, p 130 (USSR)

AUTHOR: Glikman, L. A.

TITLE: Stability of Residual Stresses and Their Effect on Mechanical Properties of Metal and Strength of Components (Ustoychivost' ostatochnykh napryazheniy i ikh vliyaniye na mekhanicheskiye svoystva metalla i prochnost' izdeliy)

PERIODICAL: Tr. Leningr. inzh. ekol. inst. 1956, Nr 13, pp 145-203

ABSTRACT: After analyzing experimental investigations (performed by Glikman as well as by other authors) the results of which are recorded in technical literature the author presents the following conclusions: 1) Stability (preservation) of residual stresses in steels is very great (the reduction amounts to 6-8%) even after prolonged periods at room temperature; at temperatures of 300°C and higher the residual stresses diminish considerably. 2) Under static loading the residual stresses are preserved until the summary stresses (residual stresses plus stresses due to external loads) exceed the elastic limit; the residual stresses are relieved when residual deformations equivalent to 0.5-1% appear. 3) Under cyclic

Card 1/2

SOV/124-58-3-3518

Stability of Residual Stresses (cont)

loading, the residual stresses diminish noticeably when the summary stresses exceed the cyclic elastic limit. Reduction of residual stresses by the action of cyclic loads is not recommended. 4) Strength of plastic materials is not affected by residual stresses; this holds true for materials in uniform as well as nonuniform states of stress. In the case of a uniformly stressed material residual stresses bring about a reduction of the limits of proportionality, elasticity, and yielding. 5) In the case of brittle materials and plastic materials with tendencies toward brittle fracture (under conditions of reduced temperature, increased loading rates, notching) residual stresses always reduce the strength of uniformly stressed materials and, depending on their distribution, either lower or increase the strength of materials which have been stressed nonuniformly. 6) Residual stresses of linear or planar nature do not affect the susceptibility of metals to brittle fracture; residual stresses of three-dimensional character, however, may cause the metal to become brittle. 7) Residual compressive stresses in the surface layer increase fatigue resistance of materials during bending, whereas residual tensile stresses impair this property (by reducing the cycle amplitude at the fatigue limit). Bibliography: 86 references.

A. D. Kovalenko

Card 2 2

"APPROVED FOR RELEASE: 09/24/2001

CIA-RDP86-00513R000500030014-8

APPROVED FOR RELEASE: 09/24/2001

CIA-RDP86-00513R000500030014-8"

KASHCHENKO, Georgiy Antonovich, professor; GLIMAN, I. I., professor,
doktor tekhnicheskikh nauk, redaktor; LEYKINA, T. L., redaktor
izdatel'stva; BOIKHOVITINOV, N. F., professor, doktor tekhnicheskikh
nauk, professor, retsenzent; SOKOLOVA, L. V., tekhnicheskij redaktor.

[Principles of physical metallurgy] Osnovy metallovedeniya. Izd. 3-e,
dop. i perer. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry,
1957. 395 p. (MLRA 10:6)

(Physical metallurgy)

GLIKMAN, L. A.

AUTHOR: Glikman, L.A., Doctor of Technical Sciences, 114-11-5/10
A.V., Candidate of Technical Sciences and Chizhik, A.I.,
Engineer.

TITLE: Heat-resistant Materials for Power Machinery Building. (Zharko -
prochnyye materialy dlya energomashinostroyeniya)

PERIODICAL: Energomashinostroyeniye, 1957, Vol.3, No.11, pp. 22 - 25
(USSR)

ABSTRACT: The article commences with a statement of the importance of studying mechanical properties of metals at high temperatures and with a review of early work on this subject in the USSR. After the war, work developed extensively on the study of the properties of heat-resistant materials. New laboratories for this purpose were set up in the Central Scientific Research Institute of Engineering Technology (TsNIITMASH), the Central Scientific Research Institute for Ferrous Metallurgy (TsNIICHERMET) at the Neva Works imeni Lenin (NZL), the Khar'kov Turbine Works (KhtZ) and elsewhere and the laboratories at the Central Boiler Turbine Institute (TsKTI) and the Leningrad Metal Works (LMZ) were extended. In the solution of metallurgical problems involved in the manufacture of new heat-resistant materials, a leading part has been played by such enterprises as "Elektrostal", the Ural Engineering Works (Uralmashzavod), the Neva Works

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imeni Lenin, the New Kramatorsk Engineering Works (NKMZ) and others.

A detailed study was made of the kinetics of failure over a long time and of the kinetics of structural changes in the properties of materials exposed to high temperatures for a long time. As a result of this work it was possible to draw up a number of analytical relationships. An example is given of such a relationship between the long-term ultimate strength of heat-resistant steel and the temperature. This formula includes a coefficient which varies greatly from one steel to another and appropriate values may be taken from the graph given in Fig. 1. The accumulation of test data on long term failure made it possible to develop the general view of the changes that take place in plastic properties at high temperatures as a function of the mean rate of creep and time to failure. It was shown that the development of inter-crystalline failure with a reduction in the rate of creep or with increase in the test time leads to the appearance of a range of rates of creep in which there is a marked reduction in the plasticity and increase in the brittleness. Changes in the plastic properties of a number of steels as a function of the mean rate of creep are shown in Fig. 2.

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Turbine Institute and at Leningrad University resulted in the derivation of a relationship between the quantity of metal reacting with oxygen and the time. A great deal of work was done on the ageing of high alloy steel by study of the structure and properties of a group of steels after lengthy exposure to high temperature. It was shown that, for a number of materials, identical structures can be obtained at different ageing temperatures by altering the test time. For many materials, the structural condition can be related to the impact strength. This is very useful in maintenance work. Procedures have been developed for studying the fatigue strength at high temperatures.

Recently, more attention has been paid to physical methods of investigation, such as determination of thermal conductivity and temperature coefficient of expansion.

Experimental results on creep in pipes under pressure have been compared with results of the usual tension tests and a method has been developed for calculating the equivalent stress in pipes under pressure from the results of tests on ordinary specimens that is applicable to all boiler steels (see Fig.5). The development of the first boilers and turbines for super-high steam conditions provided a great stimulus to the investigation of heat-resistant materials. Examples of heat-resistant

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materials which have been developed and investigated in detail and which have found wide application in power engineering are listed in a table. The table lists 16 brands of steel and for each gives the heat treatment, the test temperature, the mechanical properties, the creep limit and the long-term ultimate strength.

In the article special mention is made of certain steels. Steel P-2 is widely used for forged rotors. Another heat-resistant rotor material is chrome-tungsten-molybdenum steel ~~3M~~-415 which has high structural stability.

An important pearlitic steel for casting is brand ~~20XM07~~ which is used at operating temperatures of up to 540 °C. Use is now beginning to be made of a new cast-chrome-molybdenum-vanadium steel ~~15XM10~~ which can be recommended for parts operating at temperatures up to 570 °C. A series of new pearlitic steels has been developed for super-heater tubes and steam pipes. Steel ~~12XM0~~ is intended for operation at temperatures of up to 570 °C is an example and so are steels ~~3M~~-531 and ~~3M~~-454. A major task at the present time is to extend the use of cheaper steels with favourable technological properties. Work is being carried out on the development of new steels. Particularly interesting results have been obtained with materials based on stainless 12% chromium steel which also contains such elements as molybdenum,

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tungsten, vanadium and niobium to a total content of 1-3%. These steels are used after heat treatment. Steels of this kind are 15X11MΦ, 15X12BMΦ and 1X12B2MΦ. Variants of cast-chromium heat-resistant steels are of considerable interest; materials of these kinds are steels X11MΦ and X11MΦA.

Since the war, investigational work and developments in metallurgical work on casting and forging have led to the development of a series of heat-resisting austenitic steels. One of the first of these which has been studied in the most detail is steel ЭИ-405 which has satisfactory technological properties and sufficiently high heat-resistance to combine with good structural stability. It has been used for the manufacture of blades and a number of other parts of turbines for super-high steam conditions and for gas turbines. During development work on the welded rotor for a gas turbine several large parts were made from this steel using different manufacturing procedures. The parts were subsequently tested at the Leningrad Metal Works and the Central Boiler Turbine Institute and it was found necessary to improve the quality of ingots and the technology of hot working. A good deal of work was done on the welding of this steel.

Steel ЭИ-572 has been manufactured and rolled by the "Elektro-Card5/7stal" Works and investigated in detail by the Central Boiler

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Turbine Institute. It has a high relaxation stability and low sensitivity to the presence of cuts so that it is very suitable for the manufacture of studs and bolts intended to operate at temperatures of up to 580 °C, and also for large forgings for gas turbine discs and rotors.

Steel M-612 , a chrome-nickel austenitic steel alloyed with tungsten and titanium, has been developed. It has good mechanical properties in the temperature range 20 - 650 °C. The impact strength is maintained at a high value after prolonged ageing at 650 - 700 °C.

A great deal of work has been done on the development and use of cast austenitic steel. One such steel is brand MAl which has high heat-resistance and stability so that it can be used at working temperatures of up to 650 °C. Considerable difficulties had to be overcome in the manufacture of castings of heat-resistant austenitic steels because of their tendency to form films, which leads to the formation of various defects on the surface of the ingots. These defects are found in all existing austenitic heat-resistant steels. Reliable welds can be made of these steels only in regions from which such defects and porosity are completely absent. A good deal of work has been done on cast austenitic steel x25H13T-M which has been used for

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Heat-resistant Materials for Power Machinery Building

114-11-5/10

617

AUTHORS: Glikman, L.A., Dr. of Technical Sciences, Prof. and Zobachev, Yu. Ye., Candidate of Technical Sciences. (Central Marine Research Institute).

TITLE: Influence of shot peening on the cavitation resistance of metals tested by means of a magneto-striction vibrator. (Vliyaniye drobestruynogo naklepa na kavitatsionnyu stoykost' metallov pri ispytanni na magnitostriksionnom vibratore).

PERIODICAL: "Metallovedenie i Obrabotka Metallov" (Metallurgy and Metal Treatment), 1957, No.5, pp.38-41. (U.S.S.R.)

ABSTRACT: Grossman (2) found that shot peening has a favourable influence on cavitation resistance but his results were not unequivocal. In this paper the results are described of experiments aimed at studying the influence of shot peening on the cavitation resistance of carbon steels containing 0.4 and 0.53% C, on brass and on an austenitic steel. Specimens were made of these materials which were subjected to cavitation tests on a magnetostriction vibrator after shot peening. The depth of the work hardened layer was 0.2 to 0.25 mm for the austenitic steel and 0.1 to 0.15 mm for the brass. The authors did not detect any appreciable influence of shot peening on the cavitation strength. The shot peened surface layer increases somewhat the resistance of the metal to plastic deformation but this increase

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Influence of shot peening on the cavitation resistance
of metals tested by means of a magnetostriction
vibrator. (Cont.) 617

is not large enough to reduce appreciably local plastic deformation caused by the mechanical effect of the hydraulic impacts during the collapse of bubbles. The relatively slight increase in the strength of the surface layer does not compensate the adverse influence caused by the decrease in the corrosion stability of the metal. 4 Tables; 5 Russian, 1 American references.

Card 2/2

129-10-9/12
AUTHOR: Glikman, L.A., Doctor of Technical Sciences, Professor,
and Babayev, A.N., Candidate of Technical Sciences.
TITLE: Cases of fatigue fractures of marine shafts. (Ustalostnaya
prochnost' obrabotki, naplavlennykh avtomaticheskoy svarkoy
pod flyuson)

PERIODICAL: "Metallovedeniye i Obrabotka Metallov" (Metallurgy and
Metal Treatment), 1957, No.10, pp.37-45 (U.S.S.R.)

ABSTRACT: There were cases of fatigue fractures of marine shafts
which, after wear and corrosion, were dimensionally restored
by welding. Therefore, the authors decided to determine the
fatigue strength of specimens with deposits produced by automatic welding
under flux. Earlier, one of the authors (3) studied the tech-
nology and the method of selection of welding regimes, aimed
at obtaining the necessary mechanical properties and absence
of cracks in the thermally influenced zone and in the weld zone.
Furthermore, the influence was studied of the temperature of
preliminary heating and also of the geometry of the weld deposit
on the magnitude and distribution of the residual stress.
The experiments were made with specimens of 60 mm dia. since
preliminary tests showed that this diameter permitted welding
along the generatrix, along a spiral at an angle of 45° and
along a ring. The specimens were made of steel 40, the compo-

Card 1/3

Cases of fatigue fractures of marine shafts. 129-10-9/12
(Cont.)

sition of which was as follows: 0.4% C, 0.26% Si, 0.57% Mn, 0.033% S and 0.022% P; the mechanical properties after annealing at 840 C were $\sigma_s = 28 \text{ kg/mm}^2$, $\sigma_b = 58 \text{ kg/mm}^2$, $\delta_5 = 25\%$ and $\psi = 45\%$. The welding was effected with direct current of reverse polarity. The graph, Fig. 2, shows the results of fatigue tests of specimens in the original state, after restoration by welding along the generatrix, after restoration by welding along the spiral at 45° , after restoration by welding along the ring and also after restoration by means of rolls and restoration followed by work-hardening by tempering for two hours at 630 C. The various mechanical properties, after different regimes of restoration and treatment, are plotted in the graphs, Figs. 3 to 6. It was found that the fatigue limit of specimens with weld deposits amounted to only about 36% of the fatigue limit of the metal in the original state and was independent of the angle between the direction of feeding the weld deposit and the specimen axis. Tempering for 2 hours at 630 C improves the fatigue limit of the specimens with weld deposits to 10 kg/mm^2 , whilst for specimens which were work-hardened by rolls with a pressure of 600 kg the fatigue limit increased to 14 kg/mm^2 ; these values represent 44% and 64% respectively of the fatigue

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Cases of fatigue fractures of marine shafts. (Cont.) 129-10-9/12
limit of the metal in the original state. The most likely
cause of the low fatigue limit of the specimens with weld
deposits consists of the simultaneous action of residual ten-
sile stresses and welding defects which play the rôle of stress
concentrators; these defects are, in the given case, of funda-
mental importance.

There are 6 figures, 2 tables and 10 references, 9 of which
are Slavic.
ASSOCIATION: Central Marine Scientific Research Institute (TsNII)
and Leningrad Ship-building Institute (Leningradskiy
Korablestroitelnyy Institut)

AVAILABLE: Library of Congress

Card 3/3

GLIKMAN, L.A.; SUPRUN, L.A.; KOSTROV, Ye.N.

Method for corrosion fatigue testing of specimens 60mm in diameter.
(MIRA 10:6)
Zav. lab. 23 no.3:343-345 '57.
(Corrosion and anticorrosives) (Metals--Fatigue)

GLIKMAN, L. A.

32-9-21/43

AUTHOR: Kolgatin, M.N., Glikman, L.A., Teodorovich, V.F.
TITLE: A Method for Long-Duration Tension Tests of Tube-Shaped Samples With Internal Hydrogen Pressures at High Temperatures (Metodika dlitel'nykh ispytaniy na razryv trubchatykh obratstsv pod vnutrennim davleniyem vodoroda pri vysokikh temperaturakh)
PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol. 23, Nr 9, pp 1098-1101 (USSR)
ABSTRACT: A special plant and a special method of investigation, by which internal hydrogen pressures and the influence exercised by them on the refractoriness of the tubes (or, to be more accurate, upon their fatigue limit) are developed. There follows a description of the plants and of the experimental method. The sample is heated in an electric furnace up to the given temperature for 4-5 hours with a subsequent pause of 1 hour. Next, hydrogen is introduced through a valve until in the sample any pressure corresponding to the amount of tension in the walls of the sample is attained. The amount of this tension is computed according to a formula. In order to ascertain the influence exercised by hydrogen upon the fatigue limit analogous investigations were carried out in nitrogen. It is shown that hydrogen exercises a considerable influence upon the reduction of the fatigue limit of steel "20" at 200, 450 and 500°C. At all test temperatures and different times needed for the tearing of

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32-9-21/43

A Method for Long-Duration Tension Tests of Tube-Shaped Samples With Internal Hydrogen Pressures at High Temperatures

the samples of steel "20" in hydrogen, the character of destruction was observed to be brittle. An investigation of the same type of steel in nitrogen during a relatively short duration of tearing showed that the destruction of the tubes was accompanied by considerable plastic deformation. It was found that the destruction of steel "20" with internal hydrogen pressure always takes place at the granular boundaries. The plant described permits a simultaneous investigation of a relatively large number of samples of tubes. There are 7 figures and 7 references, 3 of which are Slavic.

ASSOCIATION: Leningrad Institute for Petroleum Refining and for the Production of Artificial Liquid Fuels (Leningradskiy institut po pererabotke nefi i polucheniya iskusstvennogo zhidkogo topliva)
AVAILABLE: Library of Congress

Card 2/2

1951-52-9/17

AUTHORS: Glikman, L. A., Doctor of Technical Sciences, Professor
 and Lebedev, M. M., Candidate of Technical Sciences

TITLE: Investigation of the Radiation Structure of the
 Residual Layer of a Polymer Film (Isobutene) Antistatic
 and Polymer Electrolyte

PERIODICAL: Metallotekhnika i Khimiya, No. 1, 1951, pp. 1-4

ABSTRACT: The radiation structure of the residual layer of a polymer film was investigated by means of electron spectroscopy. The results show that the residual layer is a complex structure consisting of a number of layers. The thickness of the residual layer was determined by means of the Benou and Kughaov method. The results show that the residual layer is a complex structure consisting of a number of layers. The thickness of the residual layer was determined by means of the Benou and Kughaov method. The results show that the residual layer is a complex structure consisting of a number of layers. The thickness of the residual layer was determined by means of the Benou and Kughaov method.

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Card 3/4

GLIKMAN, L.A., doktor tekhn.nauk, prof.; BABAYEV, A.M., kand.tekhn.nauk

Investigating residual stresses in steel cylinders caused by
building up the surface by means of automatic welding with
flux. Trudy LEBI no.23:18-26 '58. (MIRA 12:5)
(Strains and stresses) (Electric welding)

GLIKMAN, L.A., doktor tekhn.nauk, prof.; KOSTROV, Ye.N., inzh., aspirant

Effect of the scale factor on the fatigue strength of steel.
Trudy LIEI no.23:27-45 '58. (MIRA 12:5)

1. Tsentral'nyy nauchno-issledovatel'skiy institut Morskogo
flota (for Kostrov).
(Steel--Fatigue)

GLIKMAN, L.A., doktor tekhn.nauk, prof.

Problem of the physical nature of mechanical aging. Trudy LIXI
no.23:118-123 '58. (MIRA 12:5)
(Metals--Testing)

GLIKMAN, L.A.; KOSTROV, Ye.N.; SUPRUN, L.A.; YELIN, I.A.; SHCHERBAKOV, P.S.;
ZOBACHEV, Yu.Ye.; DOBRER, V.K.; STRUMPE, P.I., kand. tekhn. nauk, otv.
red.; ARAKELOV, V.M., nauchnyy red.; BAMA, N.G., red.; KOTLYAKOVA, O.I.,
tekh.n.red.

[Organization and technology of ship repair; corrosion and
mechanical strength of metals] Organizatsiia i tekhnologiya
sudoremonta; voprosy korrozionno-mekhanicheskoi prachnosti
metallov. Leningrad, Izd-vo Morskoi transport 1959. 76 p.
(Leningrad. tsentral'nyi nauchno-issledovatel'skii institut
morskogo flota. Trudy no.22) (MIRA 12:5)
(Metals--Testing) (Corrosion and anticorrosives)

BLIMAN L A

PLANS I BOOK REVISIONS DIV/ST/5

Metallurgy; abstract study, No. 5 (Physical Metallurgy Collection of Articles, No. 5), Leningrad, September, 1959. 300 p. 5) the copies printed.

Ed.: G. I. Eppstein, Candidate of Technical Sciences; Library and Tech. Div. S. I. Brovchenko.

PURPOSE: this collection of articles is intended for scientific personnel at research and educational institutions and industrial plants and also for advanced students.

CONTENTS: The articles report the results of investigations of 1) the effect of metal impurities on the susceptibility of non-ferrous and heat-resistant steels and titanium alloys to brittle failure at various temperatures under various conditions of loading (long-time, short-time, cyclic, impact); 2) the structure, and condition of alloys as related to their mechanical properties, and 3) corrosion resistance and evaluation of the effect of mechanical stresses. The articles are accompanied by abstract Soviet and non-Soviet references. The personalities are mentioned.

Zaytsev, A. S., Doctor of Technical Sciences, Professor. Study of Steel Metallurgical Processes During Heating and the Effect of Alloying Elements on Them 3

Popova, Tsch., Candidate of Technical Sciences; S. N. Golov, Engineer and Ye. A. Mironenko, Technician. Effect of Nitrogen on the Mechanical Properties of Chromo-Nickel-Chromium-nickel-titanium Intermetallics 15

Reznik, L. S., Doctor of Technical Sciences; and S. E. Kuznetsov, Engineer. Mechanism of Hydrogen Embrittlement in Steel 21

Plitinskii, I., Doctor of Technical Sciences, Professor; N. B. Shteyn, Engineer; V. P. Pecherovitch, Candidate of Technical Sciences; V. I. Kuznetsov, Engineer; V. P. Pecherovitch, Candidate of Technical Sciences; V. I. Kuznetsov, Engineer. Change in Mechanical Properties of Steel Under the Action of Hydrogen at High Temperatures and Pressures 25

Kozlov, L. M., and Ye. D. Kozlov, Engineer. Investigation of the Mechanism of Hydrogen Embrittlement of Titanium and Its Alloys 27

Shakhin, S. I., Candidate of Technical Sciences. Role of Intermetallic Phases in the Heat Treatment of Magnesium Constructional Alloys 31

Gol'dshtrayn, L. M., Engineer. Stability of Structures of Properties of Temporal Steel 126

Samokhin, A. L., Candidate of Technical Sciences. Kinematic and Thermodynamic Studies in Superconducting Steel 115

Chernov, V. I., Engineer. Susceptibility of Titanium and Its Alloys to Brittle Failure Under Impactive Loading 130

Chernobin, B. E., Candidate of Technical Sciences. Investigation of the Mechanical Properties of Structures and Treatment of the Brittle Failure Crack in Testing Steel for Mechanical Properties 139

Moskvin, P. G., Doctor of Technical Sciences, Professor. Study of Corrosion on the Strength of Metals as Related to Their Metallurgical Treatment 145

Orlov, S. B., Candidate of Technical Sciences. Investigation of the Mechanical Properties of Structures in Magnesium and Aluminum of Structures for Constructional Steel 150

SOV/129-59-3-5/16

AUTHORS Kelgavin, N.H. Engineer, Glikman, L.A. Doctor of Technical Sciences Professor, Teodorovich, V.P., Candidate of Chemical Sciences and Deryabina, V.I., Engineer.

TITLE Sustained Strength of Steels During Investigation of Tubular Specimens Subjected to an Internal Pressure of Hydrogen at Elevated Temperatures (Dlitelnaya prochnost sta oy pri ispytaniy trubchatykh detal'ov pod vnutrennim davleniyem vodoroda pri vysokikh temperaturakh)

PERIODICAL Metallovedeniye i Termicheskaya Obrabotka Metallov, 1959, Nr 3, pp 19 - 24 (USSR)

ABSTRACT A.A. Zakhartov (Ref 1) and Sh.N. Kats (Ref 2) have established that in certain calculations of the stresses in tubes subjected to internal pressures by a neutral medium, the sustained strength at elevated temperatures equals the sustained strength in ordinary tensile tests. Therefore it is possible to use the results of sustained tensile tests for calculating the permissible stresses. In a number of cases, the permissible stresses can be chosen correctly only by taking into consideration the

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SOV/129-57-5-5/16
Sustained Strength of Steels During Investigation of Tubular
Specimens Subjected to an Internal Pressure of Hydrogen at
Elevated Temperatures

Influence of the aggressive media which produce the internal pressures inside the tubes at the particular elevated temperatures. Of such aggressive media, hydrogen is of considerable importance. The authors of this paper have produced a test rig and evolved a method of testing for sustained failure of tubular specimens which are subjected to internal pressure of various media at elevated temperatures. This test rig has been described in earlier work of some of the authors of this paper (Ref 3). In the here described work it was applied for studying the sustained strength of tubular specimens of various steels subjected to internal pressure of hydrogen and nitrogen at elevated temperatures. As a neutral medium, molecular nitrogen was chosen which enabled evaluating the influence of hydrogen on the sustained strength of the tubes. The chemical compositions and the mechanical properties of the investigated (8) steels are entered in Tables 1 and 2. In addition to these, steel containing 6% Cr

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SOV/129-59-3-5/16

Sustained Strength of Steels During Investigation of Tubular Specimens Subjected to an Internal Pressure of Hydrogen at Elevated Temperatures

and supplementary additions of W, V, Mo and Nb was studied. Of the eight materials enumerated in Table 1, the tests on commercial iron were carried out at 450 °C and the respective results are graphed in Figure 1. A sharp drop in the sustained strength was observed for tubular specimens subjected to internal pressure of hydrogen, brittle failure with a pronounced intercrystallite character was observed, whilst in equal specimens subjected to internal pressure with nitrogen the failure was accompanied by appreciable plastic deformation and the failure was intracrystalline. The results for the other materials tested are also graphed. On the basis of the measured strength data for sustained loading for durations of 1 000 and 10 000 hours it can be concluded that hydrogen has a considerable influence on the reduction of the sustained strength, particularly in the case of commercial iron and steel 20; at 450 °C these materials suffered a loss of 75 to 85% of their sustained strength. For low and medium alloy steels

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Sustained Strength of Steels During Investigation of Tubular Specimens Subjected to an Internal Pressure of Hydrogen at Elevated Temperatures

The drop in sustained strength was lower, amounting to about 10% at 100 °C. Of the investigated low- and medium-strength steels, the Soviet steel B1579 had the highest sustained strength at 100 °C when subjected to internal and external pressure. An interesting feature of the results was that for this steel the sustained strength dropped with increasing wall thickness of the tubular specimen and this is attributed not only to the influence of surface and surface defects but also to the more intensive influence of hydrogen as a result of higher pressures which were applied to the thick-walled tubes (400 to 600 kg/cm² for wall thicknesses of 1.5 to 2 mm and 20 to 300 kg/cm² for wall thicknesses of 3 to 5 mm). The drop in sustained strength due to the action of hydrogen under pressure at 600 °C was more than 40% and 10-15% respectively for the high-strength steels ZIL-100 and KAL-100. It can be concluded from the results that a drop in the

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SDV/129 543 4/78

Systems and Steel Tubular Investigation of Tubular
Specimens Under High Internal Pressure of Hydrogen at
Electrolytic Treatment

Investigation of the effect of electrolysis with hydrogen
on the mechanical properties and structure is
conducted on specimens of high strength steel.
The results of the investigation of the relationship between the crystal-
line structure and the mechanical strength
of the specimens are given with references.

ASSOCIATION: Institute for Scientific Research, Academy of Sciences of the
USSR, Moscow, U.S.S.R. and in the Production
of Steel Tubulars in the USSR

Card 1

GLIKMAN, L.A., doktor tekhn.nauk, prof.; KOLGATIN, N.N., inzh.; TEODOROVICH,
V.P., kand.khimicheskikh nauk; DERYABINA, V.I., inzh.

Changes in the mechanical properties of certain steels under
the effect of hydrogen at high temperatures and pressures.

Metallovedenie 3:58-73 '59.

(MIRA 14:3)

(Steel—Hydrogen content)

(Metals at high temperature)

28(5) SOV/51-25-4-51/71
AUTHORS: Glikman, L. A., Kostrov, Ye. N., Dobre., V. K.
TITLE: Tests for Corrosion Fatigue in Bending and Torsion (Ob ispytani-
yakh na korrozionnykh ustalost' pri izgibe i pri kruchenii)
PERIODICAL: Zavodskaya Laboratoriya, 1959, Vol 25, No 4, pp 456-460 (USSR)
ABSTRACT: The tests were carried out in common with the metal laboratory
of the "Elektrosila" Works. The problem of relationship between
the fatigue limits in torsion and bending under the simultaneous
effect of corrosion has not been much investigated up to date,
and the results (Refs 3,4) are contradictory. For this reason,
special investigations of steel 35 (0.35% C, 0.12% Si, 0.77% Mn,
0.027% S and 0.022% P) were carried out in this case. The
samples were made of a long bar (diameter 25 mm); they were
submitted to normalizing at 850-870°C and had the following
characteristics: $\sigma_B = 53.1 \text{ kg/mm}^2$, $\sigma_B = 62.1 \text{ kg/mm}^2$,
 $\delta_5 = 27.4\%$ and $\psi = 60.1\%$. The sketch of a sample is given
(Fig 1). The transverse fatigue tests were carried out on
machines of the type NU at a sample rotation speed of 3000 rpm.
The torsion tests were made on an especially designed machine
(designed by V. K. Dobrer, Engineer) with a certain load

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SOV/32-25-4-31/71

Tests for Corrosion Fatigue in Bending and Torsion

moment (Fig 2). The working principle of the machine consists in the fact that by an eccentrically loaded, rotating vertical axis a torsional moment varying in magnitude and direction is produced on the sample. The frequency of the load cycles is determined by the speed of the electric motor driving the vertical axis, and amounted to 2500-2500 cycles/minute. The corrosion agent was a 3% NaCl solution, and parallel tests with air were made. V. V. Marugin (Tsentral'nyy nauchno-issledovatel'skiy institut morskogo flota) (Central Scientific Research Institute of the Merchant Marine) and Ye. A. Suvorova (zavod "Elektro-... works) took part in the experiments. The fatigue curves obtained show that the corrosion-fatigue resistance greatly depends on the number of load cycles. The test results obtained show, among other things, that the relationship between the corrosion-fatigue resistance in bending and torsion remains the same for corrosion-resistant materials. There are 4 figures and 8 references, 6 of which are Soviet.

ASSOCIATION:
Card 2/2

Tsentral'nyy nauchno-issledovatel'skiy institut morskogo flota
(Central Scientific Research Institute of the Merchant Marine)

00(5)

007/20-21-7-50/00

AUTHORS: Davidenko, N. N. Academician of the AS USSR, Vitman, P. F. Professor, Doctor of Physical and Mathematical Sciences, Glikman, L. A. Professor, Doctor of Technical Sciences, Fridman, Ya. E. Professor, Doctor of Technical Sciences, Miroslavov, I. N. Candidate of Technical Sciences, Rizov, I. A. Senior Scientific Collaborator

TITLE: Yevgeniy Mikhailovich Shevandin (Yevgeniy Mikhailovich Shevindir)

PERIODICAL: Zavodskaya laboratoriya, 1958, Vol 25, No 7, p 696 (USSR)

ABSTRACT: This is an obituary written on the occasion of the death of the scientist mentioned in the title. Shevandin was one of the leading scientists in the field of material mechanics; he became famous for his investigations of the nature of destruction by brittleness and the phenomena of destruction by brittleness of metals at low temperatures carried out at the Fiziko-tekhnicheskiy Institut (Physical and Technical Institute). After 1945 the deceased dealt with the problems of cold-shortness of ferrous metals which are of great importance in ship-building. Ya. M. Shevandin published two manuals on the mechanical properties of metals as well as

Card 1/2

SCY/32-25-7-50/50

Yevgeniy Mikhaylovich Shevandin

more than 50 original papers. His monograph "Tendency of
Low-alloy Steels Towards Brittleness" was published in 1953.

Card 2/2

PHASE I BOOK EXPLOITATION

307/4591

Leningrad. Inzhenerno-ekonomicheskiy institut

Chistovaya obrabotka i sostoyaniye obrabotannoy poverkhnosti (Finishing Operations and Surface Roughness) [Leningrad] Izd-vo Leningr. univ-ta, 1960. 268 p. (Series: Its: Trudy, vyp. 30) 1,825 copies printed.

Ed. (Title page): A.A. Matalin, Professor; Ed. (Inside book): G.M. Aron; Tech. Ed.: S.D. Vodolagina.

NOTE: This collection of articles is intended for technical personnel in the machine-building industry and for students in schools of higher technical education.

COVERAGE: The collection contains articles on the problems of developing methods of mechanical machining (such as grinding and superfinishing with strain hardening, roll burnishing, fine grinding, etc.) which would serve to increase the life of machine parts exposed to friction and wear, and thereby insure high productivity and economy. Methods for determining residual stresses (only in macrostresses and microstresses) are discussed in detail. Also considered are the possibility

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Finishing Operations and Surface Roughness

SOV/4501

of using hydraulically actuated slide rests in lot production, the use of the group machining method, and an attachment for program control of an existing lathe which would not necessitate modernization of the lathe. A description of advanced production methods and work planning used in plants of the German Democratic Republic is presented. No personalities are mentioned. References accompany most of the articles.

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Finishing Operations and Surface Roughness

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Skidov, P.A., Candidate of Technical Sciences, Docent. Analysis of Performance of a Single-Coordinate System of Program Control of a Lathe [with Limit switches]

16.

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AVAILABLE: Library of Congress

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VK/wrc/gmp
11-16-60

GLIKMAN, A

1/2

RUSSIAN METALLOGRAPHY 007/0025

Sovetskoye gosudarstvennoye izdatel'stvo, Moscow, 1960.

Trilichkovaya priruchnaya knizhka po razrabotke i ispolneniyu
prikladnykh zadaniy po fiziko-khimicheskoy metallografii
i metallografii. (The state of the art of metallography in the USSR of
Metals, held Nov 25 - 27, 1959). Moscow, Institute of Metals, 1960.
378 p. Kerosin with insertion. 200 copies printed.

Resp. Ed.: I. A. Odintsov, corresponding member of the Academy of
Sciences of the USSR; Ed. of Publisher House: A. N. Chernov;
Tech. Ed.: A. P. Guseva.

PURPOSE: This collection of articles is intended for scientific
research workers and metallurgists.

COVERAGE: The collection contains papers presented and discussed
at the second conference on fatigue of metals, which was held
at the Institute of Metallurgy in May 1959. These papers deal
with the nature of fatigue fracture, the mechanics of formation

Card 1/2

Cyclic Metal Strength (Cont.)

317-325

and growth of fatigue cracks, the role of plastic deformation in fatigue fracture, an analysis of the effect of cyclic loading on fatigue strength, the plastic deformation of metals, and various fatigue test methods. Also discussed are problems in the non-elasticity of high-strength materials, the effect of stress on the effect of stress concentration on the criterion of fatigue failure, the effect of the stress concentration on the strength of metal under cyclic loads, and results of endurance tests of various machine parts. Problems connected with cyclic metal toughness, internal friction, and the effect of corrosion media and temperature on the fatigue strength of metals are also discussed. No personalities are mentioned. Each article is accompanied by references, mostly Soviet.

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NATURE OF FATIGUE FRACTURE

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SOV/6025

EFFECT OF THE STRESS CONCENTRATION
AND THE SIZE FACTOR ON THE FATIGUE
STRENGTH

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Markovets, M. F. Technological Theory of the Size Factor
in Fatigue Tests 199

CYCLIC TOUGHNESS AND INTERNAL
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Postnikov, V. S. Internal Friction and Strength
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GLIKMAN, L.A.; TEODOROVICH, V.P.; KOLGATIN, N.N.; DERYABINA, V.I.

Long-duration strength of some steels in the testing of tubular specimens under internal pressure of hydrogen at high temperatures. Khim.sera-i azotorg.soed.sod.v neft.i nefteprod. 3:439-450 '60.
(MIRA 14:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut neftekhimicheskikh protsessov.

(Steel--Testing)

(Hydrogen)

18 8200 1496 4573 583

S/032/61/027/066/010/018
0124/0001

AUTHORS: Tyshchenko, I. V., and
G. I. ...

TITLE: ...

PERIODICAL: ...

TEXT: One of the authors ...
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materials by the instant ...
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a single ...
of ...
the ...
surface layer of ...

Card 1/6

Method of determining the flow...

S/CM/et/07/01/01/01/01
 HISS, 1954

of the flow limit. A constant q is the equivalence of the flow limit that the bulge q at compression is equal to the contraction q at elongation, which results from the constant q value in plastic deformation. The flow limit $q = 0.2\%$ at elongation is, at constant deformation tolerance, $\delta = \Psi = 0.2\%$. Constant deformation is attained with the use of a point with constant indentation angle. When indenting a conical point in the metal, its surface layer of the thickness t_0 , limited by a circle of the radius r , is deformed, which results in a transformation of the disk to a conical funnel with the radius l and the thickness t_1 . The equation $q = 1 - r/l = 1 - \sin(\alpha/2)$ gives, for $q = 0.2\%$, a vertex angle $\alpha = 173^\circ$. As a cone with such a vertex angle gives indistinct, poorly measurable indentations, an equivalent four-sided pyramid with a vertex angle of 170° was chosen, which, in the following, will be called α -pyramid. It was experimentally found that for this pyramid the ratio σ_2/σ_1 (σ_1 being the flow limit at elongation, and σ_2 the mean contact pressure of the truncated cone) is very near 0.33. When determining the flow limit by indentation of the α -pyramid, a load of $P = 3000 \text{ kg}$ is used, and the mean

Card 2/3

09/53

Handwritten notes:
8/11/53
10/1/53

Oct 31 - 10/31/53

The information presented in this report is based on a review of the information available to the CIA on the subject of the development of a method for the detection of the presence of a person in a room. The method described in this report is based on the correlation of the data obtained from the analysis of the signals received from the room with the data obtained from the analysis of the signals received from the room. There are several factors which may affect the accuracy of the method.

Card 1/1

18 8200

2005
01/17/2000/007058/012
000/0101

AUTHORS: Glikman, L. A., Tsvetkov, V. A., Kuznetsov, N. S., Goryunov, V. A.

TITLE: Mechanical properties of steel specimens saturated and desaturated with hydrogen

PERIODICAL: Referativnyy zhurnal, Metalurgiya, no. 1, 1981, 4, abstract 7133 (in the collection: Khimiya i fizika azotirovaniya, pod redaktsiyey, podredaktsiyey i redaktsiyey I. I. Gerasimovskogo, t. 3, 1981, 960, 43-436)

TEXT: The influence of hydrogen was investigated upon Armco iron with composition (in wt %) C 0.03, Si 0.19, Mn 0.20, S 0.20 at 400 and 450°C - C 0.23, Si 0.34, Mn 0.47, P 0.013, Ni 0.01 and on alloy steels X2CrNiMo17-1 - C 0.17, Si 0.22, Mn 0.54, P 0.013, Ni 0.02, W 0.50, Mo 0.40, X2CrNiMo17-2 - C 0.12, Si 0.74, Mn 1.15, P 0.0125, Ni 0.31, W 0.4 and 9CrNiMo13 - C 0.12 - C 0.45, Si 0.13, Mn 0.70, Al 0.01. Besides, on steel specimens with additional traces of V, W, Mo and Nb X2CrNiMo17-1 was investigated. Almost in all saturated specimens of Armco iron and S1.20 the $\sigma_{0.2}$ flow surface is absent at transition

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17/8/000/007/004/072
4010/410

Mechanical properties of cold deformed...

Subsequent normalizing restores the flow surface, $\sigma_{0.2}$ is reduced by half as result of the hydrogen attack, and ductility is almost completely absent. As result of the heat after treatment, $\sigma_{0.2}$, δ , ψ are increased but their values remain below the original values. After the hydrogen saturation $\sigma_{0.2}$ is greatly lowered. The presence of hydrogen saturated atoms in the metal is manifested with manifestation of a brittleness effect. The metal is deformed without noticeable traces of plastic deformation. Metal 4010 is particularly subject to hydrogen crushing. $\sigma_{0.2}$ decreases from 48.0 to 45 kg/cm², $\sigma_{0.1}$ - from 44.0 to 38.0 kg/cm², δ - from 39.2 to 7.2 %, ψ - from 62.0 to 9.0%, and a_{10} - from 12.9 to 2.2 kg-cm/cm². The strength properties of a part in area, K_{10} 2 MPa and 100.8091 decrease slightly and the ductility properties decrease noticeably.

7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20.

[Abstracter's note: Complete translation]

Card 2/2

GLIKMAN, L.A., doktor tekhn.nauk; TEKHT, V.P., kand. tekhn.nauk

Effect of intermediate heatings during the fatigue process in
steel on its durability. Trudy LME no. 9, 1974, 1-6, 162.

(MIRA 1600)

(Steel--Fatigue)

(Annealing of metals)

GLIKMAN, L.A., doktor tekhn.nauk; BABAYEV, A.N., kand.tekhn.nauk;
KOSTROV, Ye.N., kand.tekhn.nauk; DAMASKINA, O.L., inzh.

Fatigue strength and residual stresses in steel specimens
surfaced with 1Kh13 high-chromium stainless steel. Trudy LMZ
no.9:138-151 '62. (MIRA 16:6)
(Steel--Fatigue) (Thermal stresses)

GLIKMAN, L.A., doktor tekhn.nauk; TEKHT, V.P., kandydat inzh. nauk
NAZAROVA, Ye.I., inzh.

Removal of residual stresses in titanium alloys with 1% content
of aluminum by means of tempering. Trudy I.M. Zhukovskiy IAO, 1961, No. 1, p. 1-4.

(Titanium alloys. Heat treatment. Residual stresses.)

GLIKMAN, L.A., doktor tekhn.nauk: *ВОПРОСЫ МЕХАНИКИ И ФИЗИКИ МЕТАЛЛОВ*, 1971, inzh.

Effect of hydrogen absorption during generation of hydrogen on the brittle strength of rapid steel. *Вопросы механики и физики металлов* (1971, No. 4) (MIRA, Moscow)

(Steel-Hydrogen content) (in Russian)

S/137/62/006/011/034/045
A006/A101

AUTHORS: Glikman, L. A., Kostrov, Ye. B.

TITLE: The effect of the scale factor upon the corrosion-fatigue strength of metals

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 11, 1962, 113 - 114, abstract 111741 (In collection: "Tsiklich. prochnost' metallov", Moscow, AN SSSR, 1962, 187-196)

TEXT: The authors studied the effect of the scale factor upon the corrosion-fatigue resistance in sea water of the following materials: structural carbon steel CT 40 (St 40) in annealed state, structural Cr-Mn-steel 40 Kh (40KhM), stainless austenitic steel 1X18H9T (1Kh18NGT) in rolled state, brass LAMTSK 55-3-1 (LMTsZh55-3-1) and LAMTSK 67-5-2-2 (LMTsZh67-5-2-2) in cast state. Results are presented on variations of the corrosion-fatigue strength of all materials under atmospheric conditions, in 3% NaCl (imitating sea water) and fresh water, depending upon the frequency of cycles, the shape and dimension of specimens. The process of corrosion-fatigue failure is determined by the interaction

Card 1/2

The effect of the scale factor upon the...

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A000/AL1

of 2 factors: namely, the corrosion and the mechanical factor. Then the relative share of these factors, under otherwise equal conditions (material, frequency of cycles, shape and dimension of specimens, corrosion medium), depends upon the basis of the cyclic effect. There are 16 references.

H. Lukashina

[Abstracter's note: Complete translation]

Card 2/2

GLIKMAN, L.A.; BABAYEV, A.N.

Stability of residual stresses occurring during shot peening
in conditions of cyclic loading. Trudy LKI no.38223-24 1962.

(MLA 16:7)

1. Kafedra svarki sudovykh konstruktsey Leningradskogo
Korablastro-Italitsyoinogo Instituta.

(Shot peening) (Strains and stresses)

S/277/63/060/001/003/017
A052/A126

AUTHORS: Glikman, L. A., Kostrov, Ye. N.

TITLE: Effect of size factor on corrosion-fatigue strength of metals

PERIODICAL: Referativnyy zhurnal, otde'l'nyy vypusk, 48. Mashinostroitel'nyye materialy, konstruktsii i raschet detaley mashin, no. 1, 1963, 4, abstract 1.48.20 (In collection: "Tsiklich. prochnost' metallov", M., AN SSSR, 1962, 187 - 198)

TEXT: The effect of the size factor on corrosion-fatigue strength of carbon steel, 40XH (40KhN) Cr-Ni structural steel, 1X18H9T (1Kh18N9T) stainless austenitic steel, ЛМЦК55-3-1 (LMtsZh55-3-1) and ЛАМЦК 67-5-2-2 (LAMtsZh67-5-2-2) brass was studied in 3% NaCl solution simulating sea water on an HЦ (HFs) machine at rotational bending. It is pointed out that under atmospheric conditions all materials studied showed the usual effect of the size factor reflecting in the reduction of fatigue strength with the increase of the diameter of samples from 9 - 10 to 60 - 70 mm. For structural steels 40 and 40Kh with the increase of the diameter of samples from 9 to 55 - 60 mm at a low-

Card 1/2

Effect of size factor on...

3/27/63/000/001/003/017
A052/A126

base cyclic stress in 3% NaCl solution the usual effect of the size factor is also observed. Beginning with a certain base of cyclic stress and at its further increase a positive effect of the size factor is observed, viz. the corrosion-fatigue strength of large samples is higher than that of small ones. With the increase of the diameter of samples from 10 to 60 mm the effect of the size factor on fatigue strength of 1Kh18N9Ti stainless steel at a simultaneous corrosion in 3% NaCl solution proved to be qualitatively the same as under atmospheric conditions. With the increase of the cyclic stress base the negative effect of the size factor on corrosion-fatigue strength of this steel intensifies due to the crevice corrosion effect mainly in large samples. Fatigue tests in 3% NaCl solution of cast brass grades LMTsZh and LAMTsZh show that the effect of the size factor under these conditions is considerably lower than in the air. The results obtained in this study confirm the supported conceptions that the process of corrosion-fatigue breakdown is determined by the interaction of corrosion and mechanical factors. Thereby the relative part played by these factors, other conditions being equal (material, cycle frequency, shape and dimensions of samples, corrosion medium) depend on the cyclic stress base. There are 16 references.

[Abstracter's note: Complete translation]

Card 2/2