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RYABCHENKOV, A.V., doktor khim. nauk, prof.; MURAVKIN, O.N., kand. tekhn. nauk

Characteristics and prevention of fretting corrosion of metals. Trudy TSNIITMASH 92:273-331 '59. (MIRA 12:8)
(Fretting corrosion)

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AUTHORS: Ryabchenkov, A.V., Dr. of Chemical Sciences Prof., Nikiforova, V. M., Candidate of Technical Sciences, Nezvanova, N. V. and Samuylenkova, V.D., Engineers.

TITLE: Experience of the Czechoslovak industry in protecting equipment exported to countries with tropical climates. (Opyt Chekhoslovatskoy promyshlennosti po zashchite oborudovaniya, eksportiruyemogo v strany s tropicheskim klimatom).

PERIODICAL: "Metallovedenie i Obrabotka Metallov" (Metallurgy and Metal Treatment), 1957, No.6, pp.59-63 (U.S.S.R.)

ABSTRACT: The authors of this paper became acquainted with Czech practice in a number of Czechoslovak works. In Czechoslovakia the corrosion conditions are subdivided into the following four groups: very favourable (closed dry spaces); favourable (spaces in which atmospheric conditions act periodically); average conditions and difficult corrosion conditions (industrial atmosphere of seaside regions). Equipment intended for tropical climates is treated as being subjected to the most severe conditions of corrosion. Czech practice is described as regards protective painting, electro-plating (3-layer Cu-Ni-Cr plating, cadmium plating followed by chromating, zinc plating followed by chromating and in some cases by coating with lacquer), copper-plating, nickel-plating,

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Experience of the Czechoslovak industry in protecting equipment exported to countries with tropical climates. (Cont.)

chromating, cadmium-zinc plating, anodising of aluminium and its alloys, conservation and packing. Fundamentally the materials and technology do not differ greatly from those used for goods supplied to countries with temperate climates. The main differences are: the enamel is made one to two layers thicker; in the case of varnishing electrical equipment and machine tools, coating enamels are used which contain fungicide additions; oil bases are used having a high content of minium; in the case of synthetic enamels, enamels with aluminium powder as pigments are used and extreme care is taken to produce a good surface quality prior to coating. Highly qualified personnel is used for the painting and surface treatment work. For tropical conditions coatings consisting of copper-nickel-chromium layers of a total layer thickness of about 30 to 45 μ are widely used; cadmium coating (8 to 15 μ) with subsequent chromating is used for springs; zinc coating (8 to 35 μ) with subsequent chromating is used predominantly for small fixing components which after fitting are varnished. Vaselines with various

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Experience of the Czechoslovak industry in protecting equipment exported to countries with tropical climates. (Cont.)

additions are used for conservation purposes. For protecting ferrous metals during storage and transportation a volatile inhibitor, dicyclohexo-aminonitride, is used.

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RYABCHENKOV, A.N., doktor khimicheskikh nauk, professor; NIKIFOROVA, V.M., kandidat tekhnicheskikh nauk; NEZVANOVA, N.V., inzhener; SAMUYLENKOVA, V.D., inzhener.

Practices of the Czech industry in protecting equipment exported to countries with a tropical climate. Metalloved.i obr.met. no.6:59-63 Je '57. (MLRA 10:7)

(Czechoslovakia--Machinery industry)
(Protective coatings)

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RYABCHENKOV, A.V.

p. 7

24-2-27/28

[illegible]enko, Ya. M. and Isakhanov, G.V.

Scientific Conference on the strength of elements of turbo-machinery at elevated temperatures. (Nauchnoye soveshchaniye po voprosam prochnosti elementov turbomashin pri vysokikh temperaturakh).

[illegible]: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, No.2, pp. 165-167 (USSR).

[illegible]: A scientific conference was held in Kiev between September 28 and October 2, 1957 on problems of strength of elements of turbo-machinery at elevated temperatures which was convened by the Institute of Metallo-Ceramics and Special Alloys (Institut Metallokeramiki i Spetsoplavov), the Institute of Structural Mechanics (Institut Stroitel'noy Mekhaniki) and the Institute of Thermal Power (Institut Teploenergetiki Akademii Nauk Ukrainskoy SSR) of the Ac.Sc., Ukrainian SSR. About [illegible] people participated representing scientific and [illegible] establishments and works of Moscow, Leningrad, Kiev, Kharkov, Minsk, Kuybyshev, etc. In his opening address, Corresponding Member of the Ac.Sc. Ukraine I. N. [illegible] pointed out the importance of the problem of high temperature strength of components of turbo-machinery.

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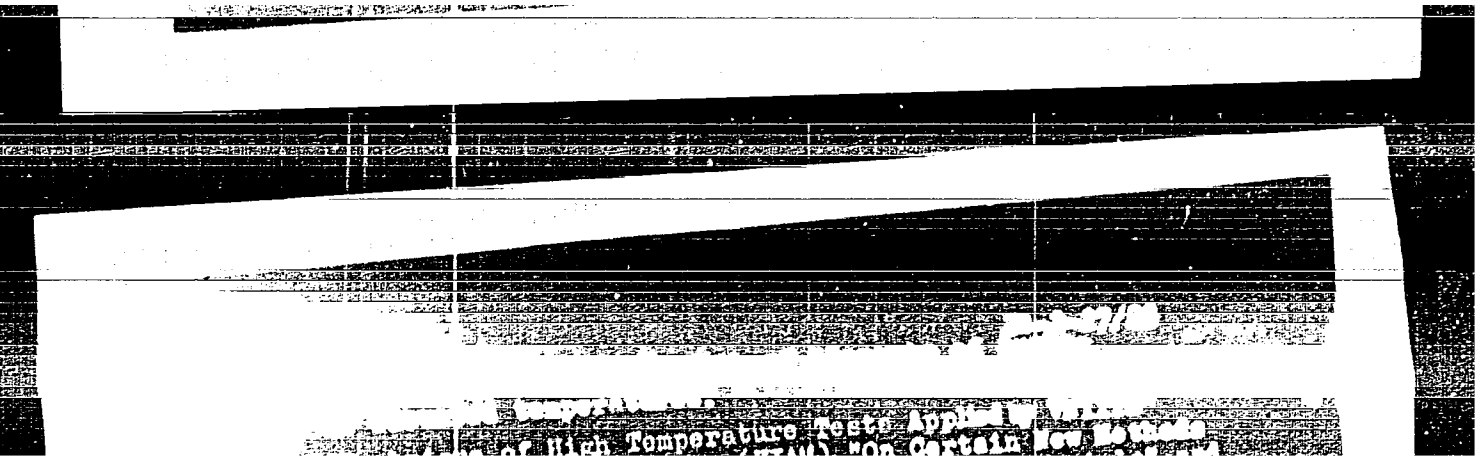

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RYABCHENKOV, A.V., prof., doktor khim.nauk; KHROMOV, V.Ye., inzh.; RYKOVA, A.V., kand.tekhn.nauk

Procedures for chromium plating of cylindrical worm shafts. Vest. mash. 38: no.9:56-58 S '58. (MIRA 11:10)
(Chromium plating) (Gearing, Worm)

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RYABCHENKOV, A.V., doktor tekhn. nauk, prof.; KAZIMIROVSKAYA, Ye.L., inzh.

Cyclic strength of austenitic steels in conditions of high temperature gas corrosion. Metalloved. i obr. met. no.3:6-10 Mr '58. (MIRA 11:3)

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya.
(Steel--Testing) (Heat-resistant alloys--Corrosion)
(Electron micorscopy)

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

SOV-129-58-6-7/17

AUTHORS: Sidorov, V.P. (Engineer), and Ryabchenkov, A.V. (Dr.Chem. Sc.Prof.)

TITLE: Corrosion Cracking of Austenitic Steels at Elevated Temperatures and Pressures (Korrozionnoye rastreskivaniye austenitnykh staley pri povyshennykh temperaturakh i davleniyakh)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, Nr 6, pp 25-32 (USSR)

ABSTRACT: The aim of the work described in this paper was to develop a method of corrosion tests under stress pertaining in steam superheaters and steam piping. The austenitic steels 1Kh18N12T, 1Kh18N9T and EI257 were investigated. The chemical analyses of these are given in Table 1, p.26 and the heat treatment regimes and the mechanical properties in Table 2, p.26. In developing a method of investigation it was necessary to reproduce the effect of all the fundamental operational factors pertaining inside steam generation equipment. The experiments were carried out by the method of recording the curves of long duration corrosion strength using a UIM-5 test machine, a sketch of which is shown in Fig.1, p.27. Due to the high demands regarding the hermeticity of the specimens, it was necessary to use

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welded joints. A tubular specimen was used for combining the functions of the autoclave and the specimen (invention of the authors of this paper). During the manufacture of the specimen transverse scratches on the internal surface were eliminated by lapping by hand. The tensile stresses in the specimen were produced by the tensile forces of the machine and by means of internal pressure. The influence was investigated of mechanical stresses, of the composition and concentration of the solutions, and of the influence of heat treatment. The graph Fig.2 shows the results of long duration corrosion strength tests on the investigated boiler type austenitic steels. In Fig.4 the dependence is graphed of the time to failure of a specimen on the concentration of a solution of NaOH (stress; 30 kg/mm^2). In Fig.5 the dependence is graphed of the time to failure of a specimen of the same steel on the concentration of NaCl in a 3% solution of NaOH. In Fig.6 the dependence is graphed of

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SOV-129-58-6-7/17

Corrosion Cracking of Austenitic Steels at Elevated Temperatures and Pressures

the time to failure of a specimen on the test temperature. The tests carried out by means of the technique for testing the long duration corrosion strength of austenitic steels in aqueous solutions at elevated temperatures and pressures allow the following conclusions to be made: (1) The steels 1Kh18N12T, 1Kh18N9T and EI257 tend to corrosion cracking in alkali solutions (the character of the failure is predominantly transcrystalline); this tendency is greatest for the steel EI257 and weakest for the steel 1Kh18N12T. (2) Of all the investigated steels, the corrosion cracking in a pure distillate with access of oxygen at 100°C occurred only for the steel EI257 during the tests lasting 1000 hours. (3) The action of the pure distillate at 300°C for 500 hours with a limited access of oxygen did not cause corrosion cracking of the investigated steels. The solutions of NaCl, Na_3PO_4, Na_2HPO_4, Na_2SO_4, Na_2SO_3 in absence of oxygen or in presence of a limited access of oxygen, do not cause corrosion cracking of austenitic steels. (4) The concentration curve of long duration corrosion strength of austenitic steels in alkali media does show a limit. Thus, the critical concentra-

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Corrosion Cracking of Austenitic Steels at Elevated Temperatures and Pressures

tion of alkali for the steel 1Kh18N9T at 210°C and $\sigma = 30$ kg/mm^2 is 3% and at 330°C it approaches 1%. (5) Addition of NaCl to alkali solutions showed an inhibiting effect on the processes of corrosion cracking. (6) The relation between the time to failure and the absolute test temperature in corrosion cracking tests in alkaline media show an exponential character. (7) Even if the heat treatment does not show an appreciable influence on the corrosion strengths of the steels 1Kh18N9T and EI257 inside alkali media, it can prevent corrosion cracking since it results in the removal of internal stresses. There are 7 figures, 4 tables and 8 references, of which 6 are Soviet, 1 English and 1 German.

ASSOCIATION: TsNIITMASH

1. Steel - Corrosion 2. Steel - Test methods

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

RYABCHENKOV, A.V.

AUTHORS: Ryabchenkov, A. V., Nikiforova, V. N., Abramova, V.F. 32-2-15/60

TITLE: The Micro-Electro-Chemical Method for the Investigation of the Corrosion of Metals Under Stress (Mikroelektrokhimicheskiy metod issledovaniya korrozii metalla pod napryazheniyem).

PUBLICATION: Zavodskaya Laboratoriya, 1950, Vol. 24, Nr 2, pp. 167-173 (USSR)

ABSTRACT: An apparatus was developed which makes possible microscopic investigations of metal samples during stress in a corrosive medium as well as the measuring of the electric potential. In principle this apparatus is composed of a device for various weights effecting the change of the stress (tension) of the sample; then the basin with the corrosion liquid in which the sample to be investigated is placed, the microscope and the electric measuring- and recording instrument. As corrosion liquids 0.01n HCl + 0.03% H_2O_2 or 0.05n HCl + 0.2% H_2O_2 were used. Samples of cast iron with sphaero graphite, steel ЭИ-69 and cast iron 16-13-3T, as well as stabilized forging steel ЭИ 572 were investigated. The results obtained prove the theory of G. V. Akimov on the character of the potential

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The Micro-Electro-Chemical Method for the Investigation of the Corrosion of Metals under Stress 32-2-13/60

change on structure surfaces; in a concrete case, for example, graphite and perlite have positive electrode potentials in relation to ferrite and in the system operate as cathodes. With the sample of cast iron 16-13-3T the assumption was proved that δ ferrite forms the cathode in the microcorrosion element austenite-δ ferrite. In order to obtain a comparison between samples under stress and those not under stress the potential differences between two samples, one under stress and one not under stress, were measured. For this purpose a special method was developed. From the graphical data obtained can be seen that there is a potential difference which increases with the increase of the stress applied, and that this increase is proportional to the current of the corrosion power. With the samples of steel ЭИ69 a special tendency for intercrystalline corrosion was observed. The potential difference between the grain bodies and the grain boundaries leads to dangerous corrosion phenomena-crack corrosion. The electro-chemical factors, according to the results obtained, play an important part in the phenomenon

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The Micro - Electro - Chemical Method for the Investigation of the Corrosion of Metals under Stress. 32-2-15/60

of crack corrosion. There are 7 figures, and 5 references, 3 of which are Slavic.

ASSOCIATION: Central Scientific Research Institute for Technology and Machine Building (Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya)

AVAILABLE: Library of Congress

1. Metals-Corrosion 2. Corrosion research-USSR

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

Ryabchenkov, A. V.

129-3-2/14

AUTHORS: Ryabchenkov, A. V., Doctor of Technical Sciences, Prof. and Ye. L. Kazimirovskaya, Engineer.

TITLE: Cyclic strength of austenitic steels under conditions of high temperature gas corrosion. (Tsiklicheskaya prochnost' austenitnykh staley v usloviyakh vysokotemperaturnoy gazovoy korrozii).

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, No.3, pp. 6-10 + 1 plate facing p.24. (USSR).

ABSTRACT: The authors considered it of interest to study the influence of high temperature gas corrosion on the fatigue strength of materials used for turbine blades. The tests were effected on a test machine Я8-М, described in earlier work (Ref.1) which permits determining the strength of a cantilever specimen in the case of circular symmetrical bending with a frequency of 2800 cycles per minute in air and in various gaseous media at room temperature as well as at elevated temperatures. The fatigue strength was studied for the two austenitic steels ЭИ612 and ЭИ673 after standard heat treatment consisting of hardening and stabilisation annealing. The results of short duration tensile tests at 20 and 650°C are entered in Table 1. The influence of various quantities of SO_2 admixtures

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Cyclic strength of austenitic steels under conditions of high temperature gas corrosion.

on the fatigue strength is illustrated by the graphs, Figs.1-3. The simultaneous influence of water vapour and SO_2 on the fatigue strength is illustrated by the graphs, Figs. 5 and 6. The loss in weight of the specimens for the two corrosive media containing respectively 0.3% SO_2 + 6% H_2O and 0.3% SO_2 for the steel ЭИ 612 at 650°C is graphed in Fig.7. Fig.4 shows a micro-photo of a micro-crack in this steel after fatigue tests at 650°C in air containing admixtures of SO_2. It is concluded that at 650°C admixtures of SO_2 reduce the cyclic strength of austenitic steels; air containing 0.3% SO_2 will reduce the fatigue limit of the tested austenitic steel by 10 to 15% compared to the values obtained in pure air. Presence of SO_2 also increases the steepness of the fatigue curves which indicates an increase in the intensity of the drop of the fatigue limit. Increase of the SO_2 concentration in the air from 0.3 to 5% brings about a further gradual decrease of the fatigue limit. In presence of SO_2 cyclic stresses bring about a change over from uniform corrosion to localised corrosion which results in a reduction of the

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Cyclic strength of austenitic steels under conditions of high temperature gas corrosion.

fatigue strength. With increasing air humidity, the adverse effect of SO_2 on the fatigue strength weakens and in an atmosphere simulating the combustion products of fuel (0.3% SO_2 and 6% H_2O) practically no reduction of the fatigue limit is observed for tests covering 10^8 cycles.
There are 7 figures, 1 table and 2 Russian references.

ASSOCIATION: TsNIITMASh.

AVAILABLE: Library of Congress.

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RYABCHENKO, A.V.; NIKIFOROVA, V.M.; ABRAMOVA, V.F.

Microelectrochemical method for investigating corrosion of metal under stress. Zav.lab. 24 no.2:167-173 '58. (MIRA 11:3)

1.TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya.
(Corrosion and anticorrosives)
(Electrochemistry)

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RYABCHENKOV, A.V.

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Akademiya nauk SSSR. Institut metallurgii. Nauchnyy sovet po problems zharoprochnykh splavov

Issledovaniya po zharoprochnym splavam, t. 5 (Investigations of Heat-Resistant Alloys, Vol 5) Moscow, Izd-vo AN SSSR, 1959. 425 p. Errata slip inserted. 2,000 copies printed.

Ed. of Publishing House: V.A. Klimov; Tech. Ed.: I.F. Kuz'min; Editorial Board: I.P. Bardin, Academician, G.V. Kurdyumov, Academician, N.V. Ageyev, Corresponding Member, USSR Academy of Sciences (Resp. Ed.), I.A. Oding, I.M. Pavlov, and I.F. Zudin, Candidate of Technical Sciences.

PURPOSE: This book is intended for metallurgical engineers, research workers in metallurgy, and may also be of interest to students of advanced courses in metallurgy.

COVERAGE: This book, consisting of a number of papers, deals with the properties of heat-resisting metals and alloys. Each of the papers is devoted to the study of the factors which affect the properties and behavior of metals. The effects of various elements such as Cr, Mo, and W on the heat-resisting properties of various alloys are studied. Deformability and workability of certain metals as related to the thermal conditions are the object of another study described. The problems of hydrogen embrittlement, diffusion and the deposition of ceramic coatings on metal surfaces by means of electrophoresis are examined. One paper describes the apparatus and methods used for growing monocrystals of metals. Boron-base metals are critically examined and evaluated. Results are given of studies of interatomic bonds and the behavior of atoms in metal. Tests of turbine and compressor blades are described. No personalities are mentioned. References accompany most of the articles.

Savitskiy, V.G., and K.V. Popov. Study of Certain Problems of the Temperature Dependence of the Plasticity of Steel From the Viewpoint of the Dislocation Theory 150

Gruzin, P.L., L.V. Pavlinov, A.D. Trutyunnik (Deceased), and G.B. Fedorov Self-Diffusion in Chromium and Molybdenum 155

Fedortsov-Lutikov, G.P., M.F. Sheshenev, R.S. Kaplan, N.I. Butko, and I.S. Marinenko. Investigation of the Properties of EI 755 Steel 160

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18(7) SOV/32-25-2-37/78

AUTHORS: Ryabchenkov, A. V., Sidorov, V. P.

TITLE: The Methodology of Continuous Corrosion Investigations in Liquid Media at Increased Temperatures and Pressures (Metodika dlitel'nykh ispytaniy na korroziyu v zhidkikh sredakh pri povyshennykh temperaturakh i davleniyakh)

PERIODICAL: Zavodskaya Laboratoriya, 1959, Vol 25, Nr 2, pp 2o4 - 2o5 (USSR)

ABSTRACT: An investigation was made of the tendency toward destructions of austenite boiler steel caused by corrosion in liquids in correspondence with the working conditions in steam superheaters and steam pipes of the boilers SVP. This investigation was carried out in order to examine the resistance of these steels at simultaneous effects of increased pressure, high temperature, and mechanical stress in the corrosion medium. An appropriate testing method was developed (Ref 1). An apparatus of the UIM-5 type was used for recording the diagrams of the continuous corrosion resistance at increased pressure and temperature, since the apparatus normally used (Ref 2) as well as the attachments to the IP-2 apparatus

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(Ref) suggested by V. N. Gulyayev and A. V. Ratner are insufficient. The sample was welded into a tube with a corrosion liquid consisting of 3% NaOH + 0.15% NaCl (Fig 1) and tested at 330° and a pressure of approximately 130 atmospheres. Austenite steel EI 257, 1Kh18N12T, 1Kh18N9T and a ferrite-martensite steel EI 754 (with 11% Cr and slight Ni, V, Mo and Nb additions) were tested. The test results show that the steel 1Kh18N12T has the highest resistance, while the steel EI 257 exhibits the lowest resistance (Fig 2). It was found that the presence of a welding seam has no effect on the continuous corrosion resistance (Fig 3). There are 3 figures and 4 references, 3 of which are Soviet.

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya (Central Scientific Research Institute of Technology and Machine Building)

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

RYABCHENKOV, A.V.; SIDOROV, V.P.

Method of long-duration corrosion tests in liquid media at elevated temperatures and pressures. Zav.lab. 25 no.2:204-205 '59. (MIRA 12:3)

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya.

(Steel--Corrosion)

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TSEYTLIN, V.Z., kand.tekhn.nauk; FILATOVA, M.A., inzh.; RYABCHENKOV, A.V., doktor khim.nauk prof.; MAKSIMOV, A.I., inzh.

Investigating the properties of the pilot-plant produced EI765 alloy used for manufacturing gas turbin parts. [Trudy] TSNIITMASH 100:192-217 '59. (MIRA 13:7)
(Heat-resistant alloys)
(Gas turbines)

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

KAZIMIROVSKAYA, Ye.L.; RYABCHENKOV, A.V.

Transformation of uniform corrosion into pitting corrosion in the course of the high temperature oxidation of metals under cyclic stress. Zhur.prikl.khim. 33 no.4:841-845 Ap '60. (MIRA 13:9)

(Steel--Corrosion)

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

S/129/60/000/011/009/016
E073/E535

AUTHORS: Ryabchenkov, A.V., Doctor of Chemical Sciences Professor and Velemitsina, V. I., Engineer

TITLE: Protection of Pearlitic Steels Against High Temperature Gas Corrosion

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1960, No.11, pp.39-42

TEXT: The authors investigated chemical nickel plating of the refractory steel 15ХМФКР (15KhMFKR) of the following composition: 0.15% C, 0.21% Si, 0.48% Mn, 1% Cr, 1.1% Mo, 1.4% Co, 0.3% V, 0.006% B, 0.02% S, 0.03% P. After washing in benzine, degreasing with Vienna lime and etching in a 50% hydrochloric acid solution, the specimens were subjected to chemical nickel plating at 90 to 92°C in a solution containing 21 g/litre of nickel chloride, 24 g/litre sodium hypophosphate, 10 g/litre sodium acetate, pH = 4.8-5.3. The plating solution was renewed every hour. Chemical analysis showed that the deposited layer contained 7.5 to 9% P. To obtain a high bond strength between the coating and the steel and to improve its mechanical properties, the specimens were heat treated at 400°C for 1 hour. The coatings remained fully

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S/129/60/000/011/009/016
E073/E535

Protection of Pearlitic Steels Against High Temperature Gas Corrosion

conserved without any traces of failure or cracking after 90° bending of the specimen. Investigation of the corrosion stability was carried out in air and super-heated steam at 650°C for 1000 hrs, with intermediate removal of the specimens after 50, 100, 200 and 500 hours. The following conclusions are arrived at:

1) No structure was revealed in the coating layer prior to heat treatment.

2) After heat treatment a layering of the coating was observed, which is attributed to the periodic nature of the deposition of the coating.

3) After tests involving holding the specimens at 650°C in steam and in air, the structure of the layer consisted of a solid solution of P in nickel with inclusions of particles of the excess phase Ni_3P, which with increasing temperature or increasing holding time at the given temperature becomes less disperse.

4) After holding for 1000 hours at 650°C, the coatings maintained a relatively high hardness (H_μ = 728) below the oxide film and, therefore, this type of plating is promising for components which are exposed to friction under normal and elevated temperatures.

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

MYABCHENKOV, A.V., doktor khim.nauk, prof.; KHROMOV, V.Ye., inzh.

Wear-resistant chromium plating of cylindrical worm shafts and testing transmissions with chromium plated worm shafts and cast iron wheels. Vest.mash. 40 no.12:21-26 D '60. (MIRA 13:12)
(Chromium plating) (Gearing, Worm)

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

RYABCHENKOV, A.V., doktor khim.nauk prof.; VELEMITSINA, V.I., inzh.

Protection of pearlitic steels from high temperature gaseous corrosion. Metalloved. i term. obr. met. no. 11:39-42 N '60. (MIRA 13:12)

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya.

(Steel--Corrosion) (Metal cladding)

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

25407 S/122/60/000/012/005/018
A161/A130

1.1800

AUTHORS: Ryabchenkov, A. V., Professor Doctor of Chemistry, and Khromov, V. Ye., Engineer

TITLE: Wear-resistant chromium plating of cylindrical worm wheels and tests of plated worm wheels in transmissions with cast iron gears

PERIODICAL: Vestnik mashinostroyeniya, no. 12, 1960, 21 - 26

TEXT: The article presents details of Engineer V. Ye. Khromov's plating method for the work profile of worm shafts (Author's Certificate no. 127120), and the results of tests of so plated worms in transmissions with cast iron worm gear instead of usual bronze gear. The purpose of plating is economy of nonferrous metal. Hard coating may also make superfluous the conventional quenching and case hardening of worms. Single-thread and double-thread worms were made of "45" steel with HB 160-217. The plating set (Fig. 1) has an anode in the form of a metal coil (1) with two plastic discs (2). The detachable coil is held by two connection plates and holes. The worm is placed between its two symmetric halves, and current is fed from anode rods to each half separately, from anode hooks (4 and 5). The worm is connected to the cathode by hooks (6) made of copper or brass and plated

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with nickel. The module, profile angle, pitch diameter and thread lead angle of the anode coil are matching the worm. The anode coil groove width in normal cross section on the pitch cylinder (δ_{n_1}) is determined by the equation

$$\delta_{n_1} = \frac{2r}{\cos\alpha} + \delta_n,$$

where α is the profile angle in normal cross section; δ_n - the thread thickness on the worm in normal cross section on pitch cylinder; n - the interelectrode space. The recommended and practically verified space between the anode and cathode is 30 - 35 mm, but it is not possible in this specific case and could be only few millimeters wide. The short space affects the plating process, and this was kept in view. The anode coils material was Ст.3 (St.3) steel. For plating large lots of worms it is better to use an alloy of 95% Pb, 3% Sb and 2% Sn. The worms were warmed for 2 - 5 min in the bath, then anode-pickled for 1 min, and plated in 800-l bath. The electrolyte composition is 230 - 250 g/l CrO_3, 1.8 - 2.7 g/l H_2SO_4. The hardness of chromium deposit obtained with cathode current of 40 amp/dm^2 was 650 - 700 and 950 - 1,000 kg/cm^2. The hardness was measured on "witnesses" plated together with the worms, using a ПМТ-3 (PMT-3) tester with 100 g load on the

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indenter. The deposited chromium layers were from 0.1 to 0.14 mm deep. Tests revealed that the efficiency of worm gear transmissions varied with changing load, i.e., increased with increasing worm rpm. The highest efficiency reached was 68 - 70% at 280 - 300 kg/m load on the worm gear shaft; the contact shear stresses in teeth of single-thread worm transmission reached 800 kg/cm^2 at 5 m/sec sliding speed, which is much higher than is permissible for cast iron gears; the friction factor at highest efficiency was 0.04. Coating hardness 650 - 700 kg/mm^2 proved insufficient, it is recommended to use 950 - 1,000 kg/mm^2. The recommended coating thickness is 0.10 - 0.15 mm. The wear of the worm gear was uneven, with a maximum on the entrance portion of the teeth, therefore, it is concluded that the couple must work in before normal operation, but in general cast iron gears can be used. Tests were conducted by TsNIITMASh at Elektrostal'skiy zavod tyazhelogo mashinostroyeniya (Elektrostal' Heavy-Duty Machinery Plant), and Moskovskiy zavod elektrotermicheskogo oborudovaniya (Moscow Electric Heat Equipment Plant). Both plants have started using chromium-plated worms. D. V. Rozov and F. A. Orlov of the Elektrostal' Heavy-Duty Machinery Plant took part in tests. There are 5 figures and 7 Soviet-bloc references.

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

S/129/62/000/007/003/008
E073/E135

AUTHORS: Ryabchenkov, A.V., Doctor of Chemical Sciences, Professor, and Sidorov, V.P., Engineer.

TITLE: Creep strength of the steel 1Х14Н14В2М (1Kh14N14V2M) operating in high pressure steam

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, no.7, 1962, 31-33 (+ 1 plate)

TEXT: The effect of high pressure steam on the creep strength of this steel (composition: 0.13% C; 0.54% Si; 0.59% Mn; 0.019% S; 0.024% P; 13.43% Cr; 13.83% Ni; 2.3% W; 0.44% Mo) in the austenised state was studied under conditions pertaining during normal operation in very high pressure steam superheaters. The proneness to intercrystallite corrosion was determined by boiling standard specimens in a solution containing 70 mℓ H_2SO_4, 30 mℓ HNO_3, and 10 g $CuSO_4$ per litre. Superheated steam (580 °C, 185 atm) lowers somewhat the creep strength and the plasticity of the steel. Specimens tested in high pressure steam showed a greater number of cracks than those tested in air. In both cases the cracks were intercrystalline.

Card 1/ ~~7~~ 2

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

Creep strength of the steel ... S/129/62/000/007/003/008
E073/E135

Fig.1 gives the creep strength ($\sigma_{\partial л}$, kg/mm^2) of specimens tested at 580 °C in steam of 185 atm pressure (line 2), and in air (line 1), as a function of the time to failure. Fig.2 gives the curves of the relative total deformation (in %) of tubular specimens of this steel tested at 580 °C in high pressure steam (curves 2, 3 and 4) and of reference specimens tested in air at the same temperature (curves 1, 5 and 6), as a function of the test duration, hours. There are 3 figures.

ASSOCIATION: TsNIITMASh

Fig.2. 1 - σ = 24 kg/mm^2, 6 hours; 2 - σ = 24 kg/mm^2, 28 hours;
3 - σ = 20 kg/mm^2, 332 hours;
4 - σ = 22 kg/mm^2, 253 hours;
5 - σ = 22 kg/mm^2, 1247 hours;
6 = σ = 20 kg/mm^2, 4071 hours.

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

S/129/62/000/012/006/013
E073/E351

Application of ....

the base metal; 3 - good resistance to high-temperature corrosion in air and superheated steam. In experiments at 650 °C for 1 000 hours, nickel-coated specimens showed a resistance-to-corrosion 36 times as high in steam and 15 times as high in air as that of uncoated steel specimens; 40 high stability at sharp temperature gradients; 30 thermal-shock cycles (400 °C - air; 400 °C tapwater; 600-620 °C, 600 °C - air) did not produce cracks in the coatings or changes in the properties and structure; 30 cycles of tapwater produced a very fine network of cracks; 5) high resistance-to-seizure - a specific pressure of 600 - 650 kg/cm^2 - of components with a chemically produced 40-μ thick nickel coating caused a specific seizure of 4-8 μ/m (in steam at 580 °C), as compared with 8-12 μ/m for chromated specimens at 444 kg/cm^2; 6) high wear resistance of nickel-coated/blank steel and nickel-coated bronze couples. The fatigue strength in air at room temperature was somewhat lowered but no adverse effect of the nickel coating was observed under alternating load at 600 °C. Use of chemical nickel-plating is recommended for pearlitic steel steam-turbine fittings for operation at

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Application of ....

S/129/62/000/012/006/013
E073/E351

140 - 240 atm. and 565 - 580 °C. This method is in use at the Venyukovskiy armaturnyy zavod (Venyukovo Fitting Works). and allows a five-fold increase in service life of fittings at this works. There are 4 figures.

ASSOCIATION: TsNIITMASh

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

RYABCHENKOV, A.V., doktor khim.nauk, prof.; SIDOROV, V.P., inzh.

Stress-rupture strength of 1Kh14N14V2M steel in an atmosphere of high-pressure steam. Metalloved. i term. obr. met. no.7:31-33 Jl '62. (MIRA 15:6)

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya.
(Pipe, Steel—Testing)
(Steam, High-pressure)

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

VISHENKOV, S.A., kand. tekhn. nauk; KASPAROVA, Ye.V., inzh.; Prinimali uchastiye: RYABCHENKOV, A.V., doktor khim. nauk, prof.; VELEMITSINA, V.I., inzh.; ZUSMANOVICH, G.G., kand. tekhn. nauk; TUTOV, I.Ye., kand. tekhn. nauk, retsenzent; KUBAREV, V.I., inzh., red.; TAIROVA, A.L., red. izd-va; MAKAROVA, L.A., tekhn. red.; MEL'NICHENKO, F.P., tekhn. red.

[Increasing the reliability and durability of machine parts by chemically nickel coating] Povyshenie nadezhnosti i dolgovechnosti detalei mashin khimicheskim nikelirovaniem. Moskva, Mashgiz, 1963. 205 p. (MIRA 16:6)
(Protective coatings) (Nickel)

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

RYABCHENKOV, A.V., doktor khim.nauk, prof.; VELEMITSYNA, V.I., inzh.; ZAMOSHNIKOV, L.D., inzh.

Use of chemical nickel coating of pearlitic steel parts in the manufacture of power engineering turbines. Metalloved. i term. obr. met. no.12:30-33 D '62. (MIRA 16:1)

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya.

(Diffusion coatings) (Nickel)

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

L 14812-65 EWT(m)/EWA(d)/EWP(t)/EWP(b) ASD(m)-3 MJW/JD

ACCESSION NR: AP4030663 S/0129/64/000/004/0018/0021

AUTHORS: Ryabchenkov, A.V.; Gerasimov, V.I.; Pongil'skiy, N.F.; Zaytsev, E.G.

TITLE: Long term corrosion resistance of Kh18N10T steel upon alternate wetting and drying

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 4, 1964, 18-21 and bottom half of insert facing p. 40

TOPIC TAGS: corrosion resistance, Kh18N10T steel, austenitic stainless steel, K-7 test apparatus, moisture corrosion resistance, tensile force, yield strength

ABSTRACT: The corrosion resistance of austenitic stainless steel upon prolonged exposure to alternate wetting and drying at temperatures to 3500 and pressures to 100 atmospheres was tested in the K-7 apparatus (fig. 1). The curve for the corrosion resistance (as determined by visual examination) of Kh18N10T steel at various stresses was constructed. At 30-40 kg/mm^2 there is a great tendency toward corrosive cracking, with the corrosion depending little on the

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

L 14812-65
ACCESSION NR: AP4030663

tensile force. At 27.5-30 kg/mm^2 the effect of stress upon corrosion resistance is quite noticeable. At 25 kg/mm^2, a force somewhat higher than the yield strength of the Kh18N10T steel, the sample appeared resistant to corrosion during the 500 hour test. Orig. art. has: 3 figures and 1 table.

ASSOCIATION: TsNIITMASh

SUBMITTED: 00 ENCL: 01

SUB CODE: MM NR REF SOV: 002 OTHER: 000

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L 14812-65
ACCESSION NR: AP4030663

ENCLOSURE: 01

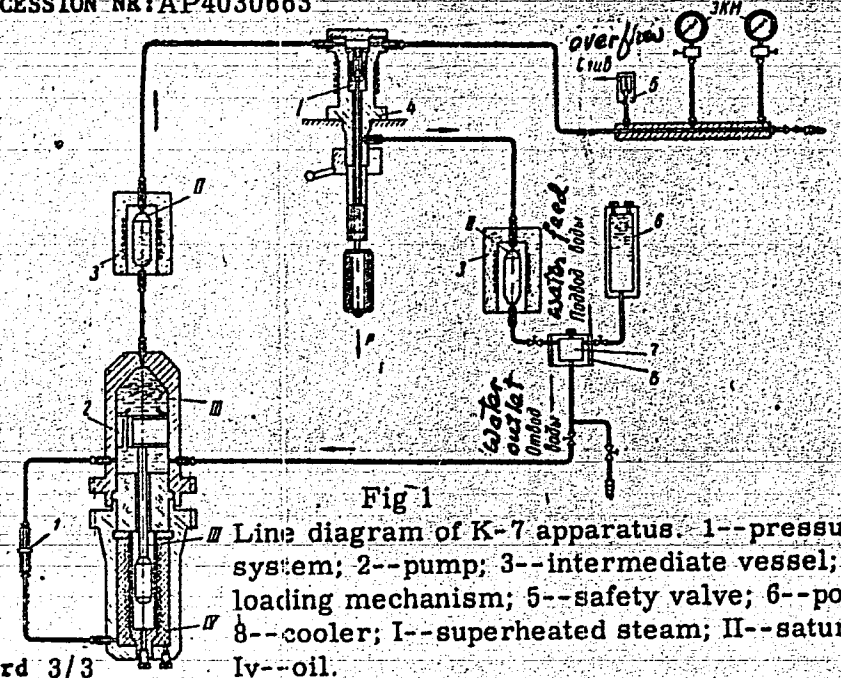

Fig 1

Line diagram of K-7 apparatus. 1--pressure equilibrating system; 2--pump; 3--intermediate vessel; 4--cartridge with loading mechanism; 5--safety valve; 6--pouring tank; 7--sampler; 8--cooler; I--superheated steam; II--saturated steam; III--water; Iv--oil.

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

L 10529-65 EWT(m)/EWP(w)/EWP(k)/EWP(b) Pf-4 ASD(m)-3/RAEM(t) HJW/

ACCESSION NR: AP4030664 JD S/0129/64/000/004/0021/0024

AUTHOR: Ryabchenkov, A. V.; Velemitsina, V. I.

TITLE: Nickel plating chromium nickel austenitic steel

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 4, 1964, 21-24, and insert facing p. 41

TOPIC TAGS: pearlitic steel, austenitic steel, chrome plating, thermodiffusing plating, oxide film, electrochemical etching, adhesive strength, microhardness, diffusion layer, metal wearability

ABSTRACT: Pearlitic steel is unsuitable for the production of steam turbine parts working at 580-600C and more; heat resistant austenitic steel is also unsuitable for that purpose because of its poor wearability. These considerations prompted the development of a chemical method of nickel-plating high-alloy chrome nickel austenitic steel (Kh18N9T and KhN35VT). But this type of steel is usually covered with an oxide film which is not easily removable and which prevents the adhesion of the coating to the ground coat. All the known chemical and electrochemical etching methods were used to remove the oxide films but none of them

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L 10529-65
ACCESSION NR: AP4030664

3

produced the desired results. Satisfactory results were finally achieved in the case of the mentioned steel samples by (i) washing them in gasoline; (ii) electrochemical degreasing in a standard alkaline solution at 70C for 5-7 min.; (iii) washing them in hot and cold water; (iv) cathode processing in a 20-25% solution of caustic soda at 70-80C for 5-6 minutes until an even thin brown layer appears, and a number of other methods. A study of the increased hardness produced by the nickel plating process justifies its recommendation for the improvement of the wearability of austenitic steel. Our new nickel-plating process is now used at the Venukovskiy plant in the production of important parts for steam turbines which must be highly wear resistant and scratchproof. The chemical method of nickel plating austenitic steel will considerably extend the service life of numerous vital steam and gas-turbine parts. Orig. art. has: 2 figures and 2 tables.

ASSOCIATION: TsNIITMASh (Tsentral'nyy Nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya) (Central Scientific Research Institute for Technology and Mechanical Engineering)

SUBMITTED: 00 ENCL: 00
SUB CODE: MM NO REF SOV: 005 OTHER: 000

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

L 64559-65 EWT(m)/EPF(c)/EPF(n)-2/EWA(d)/EWP(t)/EWP(z)/EWP(b)/EWA(h)
IJP(c) MJW/JD/WW/HW/JG/WB

ACCESSION NR: AP5007626 UR/0365/65/001/001/0048/0054

AUTHOR: Ryabchenkov, A. V.; Gerasimov, V. I.

TITLE: Effect of alloying on the stress corrosion of stainless steels in concentrated chloride solutions

SOURCE: Zashchita metallov, v. 1, no. 1, 1965, 48-54

TOPIC TAGS: austenitic steel, stainless steel, steel alloy, nickel steel, manganese steel, molybdenum steel, stress corrosion, solution property, magnesium compound, chloride, corrosion resistant steel, crack propagation

ABSTRACT:

Fifteen experimental austenitic stainless steels and alloys, containing 0.04—0.10% carbon, 0.39—0.70% silicon, 0.36—23.94% manganese, 19.34—20.50% chromium, 10.21—45.10% nickel, and 0.90—1.13% niobium, and Kh18N10T standard stainless steel were tested for susceptibility to stress corrosion. One steel also contained 0.40% boron, and two others contained about 2.5% molybdenum.

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L 64559-65

ACCESSION NR: AP5007626

2

Nickel was found to have the most beneficial effect on the resistance to stress corrosion. In tests under conditions of constant deformation (flat specimens 3 mm thick bent into a horseshoe shape) in boiling 42% solution of magnesium chloride only three alloys, all containing approximately 45% nickel, withstood 500 hr without damage. Steels and alloys with a lower nickel content suffered more or less severe damage. At a nickel content of 25—35% the first cracks appeared after 25—50 hr. However, the time period in which cracks reached a depth of 1.5—3.0 mm (complete failure) amounted to 275 hr at 35% nickel and to only 75 hr at 25% nickel. Kh18N10T steel failed in less than two hours.

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The effect of manganese is definitely negative. In relatively mild aggressive media, such as a solution of magnesium, this effect becomes noticeable only at nickel contents below 40%. However, under more severe testing conditions, such as 25% sodium chloride +0.5% potassium bichromate solution at 200C and a pressure of 16 atm, even 5% manganese in an alloy containing 40% nickel reduced the time of failure from over 500 hr to 200 hr.

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

L 64559-65
ACCESSION NR: AP5007626

Molybdenum also has a negative effect. Although it prolongs somewhat the time at which the first cracks appear, it accelerates crack propagation.

In tests under constant load in boiling 42% solution of magnesium chloride the 500 hr rupture life of all steels and alloys containing 20—45% nickel and 0.50—20% manganese was roughly the same, 53.7—55.0 kg/mm^2, compared to 14 kg/mm^2 for Kh18N10T steel and all steels with a nickel content of less than 25%. Orig. art. has: 3 tables, 3 graphs, 2 figures.

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya (Central Scientific Research Institute of Technology and Machine Building)

SUBMITTED: 15Sep64 ENCL: 00 SUB CODE: MM, GC

NR REF SOV: 002 OTHER: 004 ATD Press: 4075-F

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

L 41029-65 EPF(n)-2/EPR/EPA(s)-2/EWT(1)/EPA(bb)-2/T-2 Pg-4

ACCESSION NR: AP5001571 S/0286/65/000/006/0111/0111

AUTHORS: Ryabchenkov, A. V.; Pongil'skiy, N. F.; Zaytsev, E. G.; Borisov, D. P.; Svobodin, A. A.

TITLE: An electromagnetic piston pump. Class 59, No. 169401

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 6, 1965, 111

TOPIC TAGS: piston pump, electromagnetic pump, pump pressure equalizer

ABSTRACT: This Author Certificate presents an electromagnetic piston pump with programmed measuring of forced corrosive liquids with the help of a timing relay (see Fig. 1 on the Enclosure). The relay is made with two chambers, one of which contains the electromagnetic windings and is filled with the cooling medium; the other chamber is the working cylinder. The piston rod of the working chamber is rigidly connected to the core of the electric magnet. To provide measured forcing of the corrosive liquids under various pressures, the electromagnetic windings are shielded by a thin-walled shield. This shield is relieved from the pressure by a bellows-membrane pressure equalizer established in the trunk line between the forced medium and the cooling medium. Orig. art. has: 1 figure.

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APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

L 41029-65

ACCESSION NR: AP5008571

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya goskomiteta SM SSSR po avtomatizatsii i mashinostroyeniyu (Central Scientific Research Institute of Engineering and Machine Construction of the State Committee SM SSSR for Automation and Machine Construction)

SUBMITTED: 02Nov62 ENCL: 01 SUB CODE: PR,EM

NO REF SOV: 000 OTHER: 000

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

L 59945-65 EWT(d)/EWT(m)/EWP(w)/EPF(c)/EWP(s)/EWA(d)/EWP(v)/T/EWP(t)/EWP(k)/
EWT(z)/EWP(b)/EWP(l) Pf-4/Pad IJP(c) MJW/JD/BJ/WB

ACCESSION NR: AP5009921 UR/0032/65/031/004/0501/0503

AUTHORS: Ryabchenkov, A. V.; Sidorov, V. P.; Gerasimov, V. I.; Pongil'skiy, N. F.

TITLE: Apparatus for testing steel for corrosive cracking in aqueous solutions with known concentration of salts and oxygen

SOURCE: Zavodskaya laboratoriya, v. 31, no. 4, 1965, 501-503

TOPIC TAGS: steel, steel corrosion, corrosive cracking, oxygen / Kh18N10T steel, EP17 steel, EI695R steel, EP184 steel

ABSTRACT: An apparatus for high-temperature testing of steels for their tendencies to corrosive cracking in aqueous solutions with known concentrations of salts and oxygen was developed (see Fig. 1 on the Enclosure). It consists of an autoclave 1 with the specimens, a convection loop 2 with a heater 3 and a cooler 4, a pressure stabilizer 5, a pump 6, a doser 7, a tester 8, and an intermediate tank 9. Experiments are conducted on crescent-shaped specimens. The necessary oxygen concentration is achieved by using compressed gas. At 350C a pressure of 200 atm is maintained in the system. The interchange of liquid between the autoclave and the pressure regulator is caused by periodic temperature oscillations during the process of regulation. The salt content is

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L 49445-65

ACCESSION NR: AP5009921

corrected with the doser which is also used for a more intensive liquid exchange. The intermediate tank serves for adding gas to the stabilizer in the course of an experiment. Austenite steels Kh18N10T, EP17, EI695R, and EP184 were tested in a solution containing 500 g/liter of chloride ions and 0.4 mg/liter of oxygen. It was found that under these conditions cracking may occur very rapidly (in 500 hr). Steels EI695R and EP184 proved to be most resistant. An addition of nickel in steel increased its resistance. This method may be applied to testing for general, contact, and intercrystalline corrosion in water with a known oxygen content. Orig. art. has: 1 diagram.

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya (Central Scientific Research Institute of Technology and Machine Construction)

SUBMITTED: 00 ENCL: 01 SUB CODE: [illegible]

NO REF SOV: 001 OTHER: 002

Card 2/3

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

ACCESSION NR: AP5009921 ENCLOSURE: 01

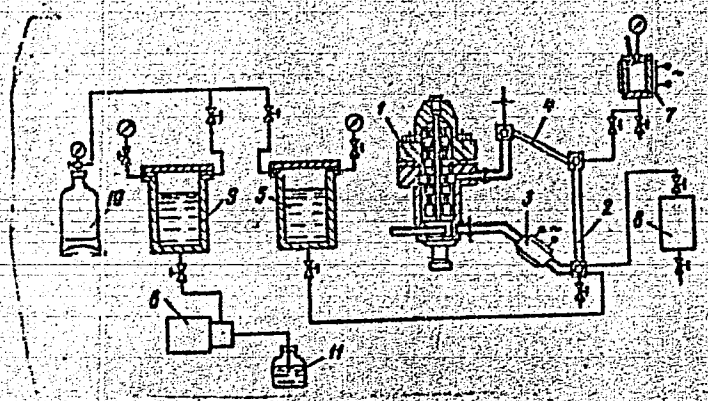

Fig. 1.

Apparatus 3-V for testing corrosion under stress at a constant deformation in aqueous solutions of high parameters at a known oxygen concentration: 10- tank with compressed gas; 11- feeding container. For other designations see text.

Card 3/3

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

L 64373-65 EWT(d)/EWT(m)/EWP(w)/EPF(c)/EWA(d)/EWP(v)/T/EWP(t)/EWP(k)/EWP(h)/EWP(z)/EWP(b)/EWP(1) MJW/JD/WB

ACCESSION NR: AP5019122 UR/0032/65/031/008/1019/1020
620.197-111

AUTHORS: Ryabchenkov, A. V.; Sidorov, V. P.; Pongil'skiy, N. F.

TITLE: Apparatus for recording long-duration corrosion strength of small-section specimens in water at high pressures and temperatures

SOURCE: Zavodskaya laboratoriya, v. 31, no. 8, 1965, 1019-1020

TOPIC TAGS: corrosion strength testing, corrosion strength, steel property, metal property, Kh18N10T steel, EP17 steel

ABSTRACT: To improve the accuracy of previous experimental apparatus designs (W. C. Schroeder and A. A. Berk. Metals Technology, No. 1, 1963; A. V. Ryabchenkov and V. P. Sidorov. Zavodskaya laboratoriya, XXV, 2, 1959), a new apparatus for recording corrosion strength of small specimens (0.5-1.0 mm thick) in water (up to 350C and 200 atm) was developed (see Fig. 1 on the Enclosure). It consists of an autoclave 1 with specimen 2, container 3, weight 4, sleeve 5, upper support 6, bracket 7, weight support 8, load release 9, and contacts 10 which signal the failure of the specimen. Sample experiments were performed with steels Kh18N10T and EP17 in a solution containing 1000 mg/liter NaCl and 40 mg/liter O_2 at a

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L 64373-65

ACCESSION NR: AP5019122

3

stress of 40 kg/mm^2, temperature 350C and pressure 200 atm. Failure occurred after 1150 and 3330 hours respectively. The apparatus proved easy to use and service. Orig. art. has: 1 figure.

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya (Central Scientific Research Institute of Technology and Machine Construction)

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SUBMITTED: 00 ENCL: 01 SUB CODE: MM

NO REF SOV: 002 OTHER: 001

Card 2/3

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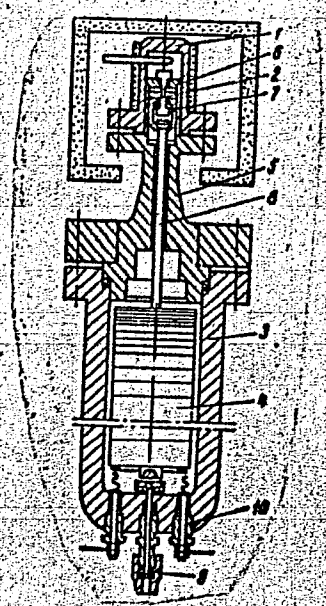
"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

L 64373-65

ACCESSION NR: AP5019122

ENCLOSURE: 01



Card 3/3

Fig. 1. Schematic of apparatus

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

RYABCHENKOV, A. V.

"Surface processing for increasing corrosion-fatigue resistance of steel," a paper presented at International Conference on Fatigue of Metals, London, Sep. 65

DSI. No. 103

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

RYABCHENKOV, A.V.; SIDOROV, V.P.; GERASIMOV, V.I.; PONGIL'SKIY, N.F.

Unit for testing steels for corrosion cracking in aqueous solutions of a given concentration of salts and oxygen. Zav.lab. 31 no.4:501-503 '65. (MIRA 18:12)

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya.

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

L 39948-66 EWT(m)/EWP(t)/ETI IJP(c) JD/WB

ACC NR: AP6015283 (N) SOURCE CODE: UR/0365/66/002/003/0257/0278

34
32
B

AUTHOR: Ryabchenkov, A. V.; Gerasimov, V. I.; Sidorov, V. P.

ORG: Central Scientific Research Institute of Technology and Machinery (Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya)

TITLE: On the nature of the stress corrosion cracking of austenitic steels and basic factors affecting this process

SOURCE: Zashchita metallov, v. 2, no. 3, 1966, 257-278

TOPIC TAGS: stress corrosion, austenitic steel

ABSTRACT: The article analyzes literature data on the nature and mechanism of the process of stress corrosion cracking of austenitic steels in chloride solutions and discusses the principal factors affecting the generation and development of fractures under stress corrosion conditions. It is shown that thus far no theory has been developed to provide an accurate explanation for the stress corrosion process, but that one should be advanced in the near future. All the known factors determining the tendency of austenitic steel toward stress corrosion cracking are divided into two main groups: (a) external factors related to the conditions of the medium surrounding the metal, and (b) internal factors determining the physicochemical properties of the metal itself (i.e., chemical composition, structure, degree of deformation, etc.). The manner in which two major factors, the composition and temperature

Card 1/2 UDC: 620.193/194 669.15-194:669.24'26

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L 07391-67 EWT(m)/EWP(t)/ETI IJP(c) DS/JD

ACC NR: AP6030447 (N) SOURCE CODE: UR/0193/66/000/008/0003/0005

AUTHOR: Ryabchenkov, A. V. (Doctor of chemical sciences); Gerasimenko, A. A.

ORG: None

27
B
16
7

TITLE: Copper plating of steel components in polyethylene-polyamine electrolytes

SOURCE: Byulleten' tekhniko-ekonomicheskoy informatsii, no. 8, 1966, 3-5

TOPIC TAGS: copper plating, electrolyte, polyamine compound, ammonium sulfate

ABSTRACT: The authors discuss the use of new electrolytes developed at the Central Scientific Research Institute of Technology and Machine Building for copper plating. These solutions are based on polyethylene-polyamine copper complexes which are superior in many respects to cyanide electrolytes. The optimum polyethylene-polyamine copper-plating electrolyte has the following composition (g/ℓ) copper sulfate 45-55; polyethylene-polyamine 50-70; ammonium sulfate 100-150. The optimum solution has an alkalinity of pH 8.2-9.0, a temperature of 18-23°C an optimum current density of 0.6-1.0 a/dm^2. The current efficiency is 85-98% depending on current density and component concentration. Current efficiency decreases with an increase in current density, polyethylene-polyamine concentration past 75 g/ℓ and ammonium sulfate concentration past 150 g/ℓ. For copper plating complex parts with deep slots, grooves, blind holes; etc. the concentration of polyethylene-polyamine and ammonium sulfate should be in-

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ACC NR: AP6030447

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creased to 100-125 and 200 g/ℓ respectively to increase the throwing power by a factor of approximately 1½ although the deposition rate is somewhat reduced in comparison with the optimum composition. Deposition rate under optimum conditions is 6-10 μ/hr. Plating procedure and sequence of operations are discussed.

SUB CODE: 11/ SUBM DATE: None

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

ACC NR: AM6008491 Monograph UR/

Ryabchenkov, Alekscy Vasil'yevich; Velemitsina, Valeriya Ivanovna

Hardening and protecting parts against corrosion by the nickel plating method (Uprocheniye i zashchita ot korrozii detaley metodom khimicheskogo nikelirovaniya) Moscow, Izd-vo "Mashinostroyeniye", 65. 0127 p. illus., biblio. 4,000 copies printed.

TOPIC TAGS: anticorrosion agent, heat resistant material, nickel plating, surface hardening, austenitic steel, carbon steel, pearlitic steel, steam turbine

PURPOSE AND COVERAGE: This book describes the surface hardening and protection of parts from corrosion in power equipment and other types of equipment by nickel plating. Also shown is the techniques of applying nickel-phosphorus coatings to heat resistant pearlitic and fire-resistant austenitic steel. The book discusses structural stability, protection and hardening properties of the surface under high temperatures. Results are given from tests made of parts with nickel-phosphorus surfaces as well as an experiment for industries use of this nickel plating method. The book is recommended for workers in industrial laboratories, technicians and assistants in the field of anticorrosion technology and surface hardening of machine parts.

TABLE OF CONTENTS (abridged):

Introduction--3

Card 1/2 UDC:621.793.3:620.197

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

RYABCHENKOV, A.V.; SIDOROV, V.P.; PONGIL'SKIY, N.F.

Apparatus for deriving the curves for corrosion stress-rupture strength in water of high parameters for specimens of narrow cross section. Zav. lab. 31 no.8:1019-1020 '65. (MIRA 18:9)

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya.

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

L 3822-66 EWT(d)/EWT(m)/EPF(c)/EWP(v)/EWP(t)/EWP(k)/EWP(h)/EWP(b)/EWP(l) 48
ACCESSION NR: AP5024828 JD/WB UR/0032/65/031/010/1265/1268 45
620.198-1.0.5 B

AUTHOR: Ryabchenkov, A. V.; Pongil'skiy, N. F.; Zaytsev, E. G.; Gerasimov, V. I.
44,55 44,55 44,55 44,55

TITLE: A device for corrosion tests under stress at high temperature and pressure 14

SOURCE: Zavodskaya laboratoriya, v. 31, no. 10, 1965, 1265-1268

TOPIC TAGS: stress corrosion, high temperature effect, pressure effect
44,55 18

ABSTRACT: The article is a description of a device patented by the authors for studying corrosion in metals under stress at high temperatures and pressures (Author's Certificate No. 154078, published in *Byulleten' izobreteniy* No. 8 1963). Schematic diagrams are given of the instrument as a whole and of its principal parts. A general schematic of the device is shown in fig. 1 of the Enclosure. The unit consists of working chamber *1* with loading device *2*, supercharger *3*, intermediate storage vessels *4* and *5* and sampler *6*. These elements form a closed circulation system with connecting tubes *7*. The installation also contains a supply tank *8*, a pressure-equalizing device *9*, protection *10* and control *11* instrumentation located on a separate control board and in the cabinet of the device. The operation of the

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3

instrument is described in detail. The installation is designed for a preprogrammed automatic testing cycle. Orig. art. has: 3 figures.

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya (Central Scientific Research Institute of Technology and Machine Building)

44,55

SUBMITTED: 00 ENCL: 01 SUB CODE: IE

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L 3822-66
ACCESSION NR: AP5024828

ENCLOSURE: 01

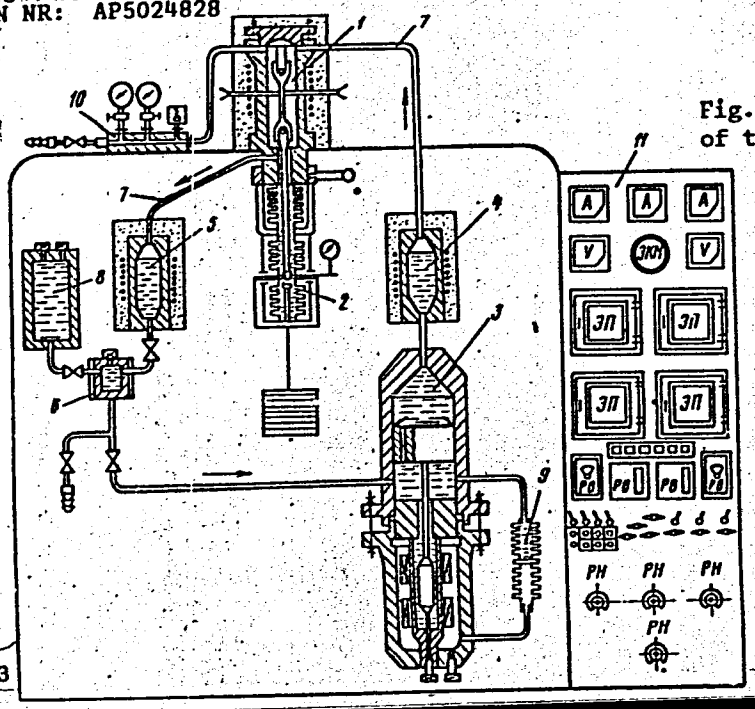

Fig. 1. Schematic diagram of the installation

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L 5456-66 EWT(1)/EPA(s)-2/EWT(m)/EWP(w)/EWP(i)/EPF(n)-2/EPA(w)-2/T/EWP(t)/EWP(b)/EWA(m)-2/EWA(c) IJP(c) JD/JG/GS

ACC NR: AT5024870 SOURCE CODE: UR/0000/65/000/000/0038/0044

93
91
B+1

AUTHOR: Prokoshkin, D. A. Arzamasov, B. N.; Ryabchenko, Ye. V.

ORG: Institute of Problems of Material Science, AN UkrSSR (Institut problem materialovedeniya AN UkrSSR)

TITLE: Siliconizing refractory metals in a glow discharge

SOURCE: AN UkrSSR. Institut problem materialovedeniya. Diffuzionnyye pokrytiya na metallakh (Diffusion coatings on metals). Kiev, Naukova, dumka, 1965, 38-44

TOPIC TAGS: refractory metal, metal siliconizing, glow discharge siliconizing, molybdenum siliconizing, tungsten siliconizing, niobium siliconizing, tantalum siliconizing

ABSTRACT: Molybdenum, tungsten, niobium, and tantalum have been siliconized at 1000 to 1200C by glow discharge in a mixture of silicon tetrachloride vapor and hydrogen flowing at a pressure of 40 mm Hg and a rate of 0.5 l/min. The glow discharge starts at 500—700 v. The rate of siliconizing in a glow discharge depended on the pressure in the reaction chamber, the volume ratio and the rate of consumption of the silicon tetrachloride and hydrogen, and the reaction temperature and was significantly higher than that of conventional siliconizing in a gaseous medium. Molybdenum had a siliconized layer 25 μ thick in 5 min, and a layer 67 μ thick in 40 min. Higher rates were also observed in tungsten, niobium, and tantalum. The siliconized coatings consisted basically of disilicides of the respective metals. Tungsten siliconized at

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1000C for 30 min had a one-layer coating consisting of WSi_2 with a hardness of 1865 dan/mm^2. Niobium and tantalum had two-layer coatings, the outer layers consisting of $NbSi_2$ and $TaSi_2$, respectively, and the inner layer having a lower silicon content. The inner layer of niobium had a hardness of 1125 dan/mm^2. Molybdenum siliconized at 1000C for 40 min had a three-layer coating; the hardness of the outer and innermost layers was 1565 and 1350 dan/mm^2, respectively. Molybdenum and tungsten disilicides had a tetragonal crystal lattice; niobium and tantalum had a hexagonal lattice. Siliconizing in a glow discharge can be done below the recrystallization temperature, which keeps the parts in the strengthened condition. The high efficiency of the process can be explained by the presence of an ionized medium and by the activated condition of the metal surface being siliconized. Orig. art. has: 4 figures. [MS]

SUB CODE: MM, EM / SUBM DATE: 06Aug65/ ORIG REF: 004/ OTH REF: 004/ ATD PRESS: 4133

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"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

BUTORIN, N.V., kand. geogr. nauk; KURDIN, V.P., ml. nauchn. sotr.; MORDUKHAY-BOLTOVSKIY, F.D., doktor biol. nauk; BEZLER, F.I., kand. biol. nauk; IL'INA, L.K., kand. biol. nauk; GONCHAROV, G.D., doktor biol. nauk; RYABCHENKOV, N.P.; PODDUBNYY, A.G., kand. biol. nauk; MIRASHEV, G., red.

[Fishery atlas of Rybinsk Reservoir] Rybopromyslovyi atlas Rybinskogo vodokhranilishcha. [Aroslavl', 1963. 20 p. (MIRA 18:9)

1. Akademiya nauk SSSR. Institut biologii vnutrennikh vod. 2. Institut biologii vnutrennikh vod AN SSSR (for all except Mirashev, Ryabchenkov). 3. Upravlyayushchiy Rybinskogo Gosudarstvennogo tresta rybnoy promyshlennosti (for Ryabchenov).

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

LAPSHIN, V.V.; SITNIKOVA, I.V.; RYABCHENKOV, V.N.; LIKHOBABENKO, A.P.; Prinimali uchastiye: FEDOROVA, N.M.; LASTOVA, N.A.; OSIPOVA, A.P.; KOZ'MINA, N.M.

Effect of the degree of branching of high density polyethylene on the mechanical properties of tubes produced by extrusion. Plast. massy no.5:22-26 '65. (MIRA 18:6)

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

RYABCHICH, V.

RYABCHICH, V., inzhener; PARSHINA, [illegible]

The scheduled large-panel [illegible] house is finished. Stroitel' no.7:2-4 Jl '57. (MLRA 10:9)
(Magnitogorsk--Apartment houses) ([illegible]est concrete construction)

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

RYABCHICH, V.F., inzh.; TSIPENYUK, I.F., inzh.

Constructing and maintaining the roofing of a large sheet-rolling mill. Prom. stroi. 40 no.8:22-27 Ag '63. (MIRA 16:8)

1. Ural'skiy filial Akademii stroitel'stva i arkhitektury SSSR.
(Roofing, Concrete—Defects) (Rolling mills)

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

SHIRIN, P.K. (Moskva); POVERENNYY, L.D. (Moskva); KAMENEV, M.O. (Moskva); BARCH, I.Z., inzh. (Khar'kov); PUSHKAREV, V.V. (Novosibirsk); BALABAN, A.I. (Khar'kov); DZHIOYEV, I.M. (Khar'kov); RUBINSHTEYN, M.Z. (Khar'kov); RYABCHICH, V.F. (Magnitogorsk); SOLOVAROV, K.N., (Kazan'); KHODOROVSKAYA, O.H. (Khar'kov); NEFEDOV, Ye.M. (Leningrad).

Discussion on plans and regulations for the organization and the technology of building. Stroi. prom. 35 no.12:5-20 D '57. (MIRA 11:1)
(Architecture--Designs and plans)
(Construction industry)

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

RYABCHICH, V.F.; TSIPENYUK, I.F.; VAKHIDOV, D.N.

The problem of the durability of the reinforced concrete elements of foundry buildings. Prom. stroi. 40 no.9:40-44 '62. (MIRA 15:11)

1. Ural'skiy filial Akademii stroitel'stva i arkhitektury SSSR.

(Foundries)
(Reinforced concrete)

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

IVANOVA, L.; KOSTINSKIY, D.; RYABCHIKOV, A.; TOLOKONNIKOVA, A.; YASHINA, V.V., red.

[India, Pakistan, Ceylon, Nepal] Indiia, Pakistan, TSeilon, Nepal. Moskva, Glav.upr.geodezii i kartografii MVD SSSR. Gos. izd-vo geogr.lit-ry, 1956. 21 p. ___ Ukazatel' geograficheskikh nazvanii. 8 p. (MIRA 13:2)

(Asia--Geography, Economic)

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

RYABCHIKOV, A. (UA9CM)

Till we meet on the air! Radio no.6:10 Je '63. (MIRA 16:7)

(Radio operators) (Amateur radio stations)

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

RYABCHIKOV, A.

Pitkhavalla, M.

Book about Pakistan ('Pakistan." M. Pitkhavalla. Reviewed by A. Ryabchikov). Vokrug sveta No. 3, 1953.

Monthly List of Russian Accessions, Library of Congress, June 1953. Uncl.

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

FEDOROV, A. (Voronezh); ZEFIROV, V. (Sverdlovsk); TEREKHOV, N. (Moskva); RYABCHIKOV, A. (Nizhniy Tagil)

Repaired by amateurs. Radio no.2:51 F '63. (MIRA 16:2)
(Television—Maintenance and repair)
(Radio—Maintenance and repair)

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

7

Preventing decarburization of steel. A. V. Ryabchenkov. U.S.S.R. 66,796, Aug. 31, 1946. To prevent decarburization of steel during heating in a fused salt bath, the steel is made the negative electrode, and a positive electrode of C is immersed in the bath.

M. Hosch

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

RYABCHIKOV, A.M.; SDASYUK, G.V.

Geography in India. Izv. AN SSSR. Ser. geog. no.6:113-119 N-D '65. (MIRA 18:11)

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9"

"APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446220012-9

1. RYABCHIKOV, A. M.

2. USSR (600)

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