

... regular and oscillatory. Theorem 2: In (3)]

1-FIW

Petrovskaya, R. V.

$u'' + u\varphi(t, t) = 0$ ($t > a$), let 1) $\varphi > 0$ for $u \neq 0$, 2) φ increase with $|u|$, and either 3) every solution of $u'' + u\varphi(u, t) = 0$ is oscillatory for every $u_0 \neq 0$ or 3') every solution of $u'' + u\varphi(u, t) = 0$ is oscillatory for some $u_0 \neq 0$ and for every $u_0 \neq 0$ $\int_a^\infty \varphi(u_0, t) dt = \infty$. Then every solution of (3) is oscillatory. A result ...

3/2

2

МАШИНОПИСЬ (Machinewritten)

SMW

1214-111-1
PETROPAVLOVSKAYA, R.V.

Associative systems structurally isomorphic to groups. Part 3.
[with summary in English]. Vest. IGU no.19:5-19 '57. (MIRA 11:1)
(Groups, Theory of)

PETROPAVLOVSKAYA, R. V. (Leningrad)

A class of groups determined by the structure of their sub-
semigroups. Mat. sbor. 66 no.2:265-271 F '65. (MIRA 18:4)

PETROPAVLOVSKIY, V.G.; OTOCHEVA, M.A., redaktor izdatel'stva; ZHOROV, D.M.,
tekhnicheskiy redaktor

[Reference manual for taking stock of fixed capital in communal housing;
a collection of decrees, instructions, orders and directives on
inventory taking (in force July 1, 1956)] Spravochnik po inventariza-
tsii osnovnykh fondov zhilishchno-kommunal'nogo khoziaistva; sbornik
vazhnishikh postanovlenii, instruktsii, prikazov i rasporyazhenii po
inventarizatsii (po sostoiianiu na 1 iulia 1956 g.). Izd. 2-oe, ispr.
i dop. Moskva, Izd-vo Ministerstva kommunal'nogo khoziaistva RSPSR,
1956. 359 p. (MLRA 9:12)

(Housing)

(Municipal ownership)

PETROPOL'SKAYA, V.M.

MEDVEDEV, K.P.(Khar'kov); PETROPOL'SKAYA, V.M.(Khar'kov).

Relation between the reactivity of coal and the surface size of
coal grains. Izv.AN SSSR,Otd.tekh.nauk no.12:129-133 D '56.
(MIRA 10:1)

(Coal--Analysis) (Combustion)

Petropol'skaya, V. M.

The behavior of pyritic and organic sulfur during the coking of coals. K. P. Medvedev and V. M. Petropol'skaya. *Izv. Akad. Nauk S.S.S.R., Otdel. Tekh. Nauk* 1955, No. 3, 134-9.—The study of coking was based on the use of tagged S atoms, as described by Kulishenko and Medvedev (*Izv. Akad. Nauk S.S.S.R., Otdel. Tekh. Nauk* 1953, 145) and has permitted following in detail the behavior of S in the different types of compds. in which it exists in coal. The amt. of pyritic and org. S eliminated with the volatile coking products and remaining in the coke, can be estd. with sufficient accuracy. The mechanism of the org. S egn. depends on the coal metamorphism stage and is lower the higher the metamorphism stage. The nonadditivity of the org. S egn. can be explained by the plastic state during the hydrogenation of the aromatic rings in coals during higher metamorphism stages. As a result, some of the S atoms in the stable heterocyclic rings of the vitrines change over into the less stable alicyclic rings in which the S atoms are connected to C with the usual bonds. This lowers the C-S energy, and increases the proportion of org. S evolved with the volatile coking products. A formula is proposed for the proportion of S in the coke: $\% S_{\text{in coke}} = 0.65 S_{\text{org}} + 0.69 S_{\text{pyr}}$, which is a modification of Thyssen's formula and represents better the results obtained with Donets coal, based on the analytical detn. of pyrite and org. S in the charge. Speculations are presented on the nature of the chem. S-C bonds in coals at different stages of metamorphism.

W. M. Sternberg

(1)

PETROPOL'SKAYA, V.M.

MEDVEDEV, K.P.; PETROPOL'SKAYA, V.M.

Behavior of pyrite and organic sulfur in coal coking processes.
Izv. AN SSSR, Otd. tekhn. nauk no. 8:134-139 Ag. '55. (MLRA 9:1)
(Coke) (Sulfur compounds)

MEDVEDEV, K.P.; PETROPOL'SKAYA, V.P.; NIKITINA, K.A.

Desulfurization of coals by atomic hydrogen. Koks i khim. no.2:
5-9 '59. (MIRA 12:3)

~~1~~ Khar'kovskiy nauchno-issledovatel'skiy uglekhimicheskiy institut.
(Coal--Carbonization) (Sulfur) (Hydrogen)

PETROPAVLOVSKIY, Ye. I.
PETROPAVLOVSKIY, Ye. I.

Mikolan Canning Combine at Krymskaia was built during the first
five-year plan. Kons. i ov. prom. 12 no.10:37-39 0 '57. (MIRA 11:1)

1. Krasnodarskiy sovet narodnogo khozyaystva.
(Krymskaia--Canning and preserving)

USSR/General Problems. Methodology. History. Scientific Institutions and Conferences. Instruction. Questions Concerning Bibliography and Scientific Documentation

Abs Jour : Ref Zhur-Khimiya, No 3, 1958, 6839
Author : Ye. I. Petropavlovskiy
Inst :
Title : Mikoyan Canned Food Combine at Krymskaya Village-Construction of First Five-Year Plan
Orig. ut : Khranitel. i ovoshchesush. prom-st', 1957, No 10, 37-39
Abstract : Asketch of the development (since 1930).

Card 1/1

PETROPAVLOVSKAYA V. N.

Don River - Sturgeons

Nutrition of young sturgeon in the Don during the down-stream migration. Trudy Gidrobiol. obshch. 3, 1951.

PETROPAVLOVSKAYA, V. N.

Sturgeons - Don River

Nutrition of young sturgeon in the Don during the down-stream migration. Trudy Gidrobiol. obshch. 3, 1951.

9. Monthly List of Russian Accessions, Library of Congress, November 1953² Unclassified.

PETROPAVLOVSKAYA, Z.N., kand. tekhn. nauk; BOGOMOL'NAYA, R.B., inzh.

Low-alloy structural steel for large power systems. Teploenergetika
12 no.4:58-63 Ap '65. (MIRA 18:5)

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

PELOPAPVLOVSKAYA, Z. N.

825. Volkova, Y. I., Tseitlin, V. Z., and Petrovskaya, Z. N., Method of relaxation testing during tension in a special appliance (in Russian), Problems of metal working of steam turbine materials, Moscow, Mashin, 1975, 10-80; Ref. Zh. Mekh 1976, Rev. 2389.

It is noted that the method used at the present time in several laboratories for testing metal for relaxation with the aid of a ring of equal resistance to bending is unable to give reliable quantitative characteristics of the relaxation resistance of components working under tension at high temperatures.

In order to obtain these characteristics another test method is recommended for relaxation with the aid of a special appliance developed by Tsel'nikova.

The appliance consists of a massive ball or mandrel made of the same material as the test specimen, into which is inserted cylindrical specimen 2-6 mm having two gage length lines which register its working portion for a length of 100 mm.

One of the heads of the specimen serves as a support, and the other has a thread for turning on a nut, with the aid of which the required tension of the specimen is produced. The elongation of the nut is effected with the aid of an appliance which makes it possible to obtain the desired deformation of the working part of the specimen with an accuracy of 0.002 mm. The mandrel together with the elongated specimen is placed in a furnace and heated to test temperature.

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1/2

VOLKOVA, T.I.; TSEITLIN, V.Z.; PETROPAVLOVSKAYA, Z.

The relaxation of the stress is determined by repeated measurement of the plastic deformation of the working portion of the specimen, previously loaded and unloaded, produced over specific intervals of time. Measurement of the deformation is performed on a universal microscope (or other instrument) with an accuracy of 0.002 mm.

In the author's opinion, this simple apparatus makes it possible to perform duration relaxation tests, enables numerous measurements of the plastic deformation to be made with sufficient accuracy, and insures the consistency of the total deformation of the specimen in the relaxation process.

F. S. Chutikov, USSR

Coastal Kuznetsovskiy Eksped

Translation, courtesy Ministry of Supply, England

2/2

VOLKOVA, T.I., kandidat tekhnicheskikh nauk; TSEBYTLIN, V.Z., kandidat tekhnicheskikh nauk; PETROPAVLOVSKAYA, Z.M., kandidat tekhnicheskikh nauk.

Method for tensile relaxation testing in a special apparatus.
[Trudy] TSNIITMASH 71:70-80 '55. (MLRA 9:8)
(Creep of metals) (Testing machines)

PETROPAVLOVSKAYA, Z.N., kandidat tekhnicheskikh nauk; TSEITLIN, V.Z.,
kandidat tekhnicheskikh nauk.

Investigating the properties of EI723 (TsZh-4) steel.
Metalloved. i obr. met. no.12:17-27 D '56. (MLRA 10:2)

1. Tsentral'nyy nauchno-issledovatel'skiy institut tyazhelego
mashinostroyeniya.
(Steel--Testing)

PETROPAVLOVSKAYA, Z. N.

ODING, I.A.: PETROPAVLOVSKAYA, Z.N., kandidat tekhnicheskikh nauk.

Effect of heat treatment on relaxation resistance of austenite.
[Trudy] TSNIITMASH no.79:61-80 '57. (MLRA 10:6)

1. Chlen-korrespondent Akademii nauk SSSR (for Oding).
(Steel--Heat treatment) (Steel--Testing)

MIRKIN, I.L.; PETROPAVLOVSKAYA, Z.N.

Effect of the composition of ferrite on the relaxation
resistance of chromium steel. Metalloved. i term. obr. met.
no.8:1-5 Ag '64. (MIRA 17(10))

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

MIRKIN, I.D.; TRUCOV, L.P.; IEROPAVLOVSKAYA, G.N.

Low-alloy heat resistant steel for electric machinery manufacture.
Metalloved. i term. obr. met. no.11:4-9 N '65.

(MIRA 18:12)

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

I 31037-66 EVT(m)/EWA(d)/EMP(t)/EMP(z)/EMP(b) MJW/JD

ACC NR: AP5027701

SOURCE CODE: UR/0129/65/000/011/0004/0009

AUTHOR: Mirkin, I. L.; Trusov, L. P.; Petropavlovskaya, Z. N.

ORG: ToNIITMASH

TITLE: Low-alloy heat-resistant steels for power generating machinery

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 11, 1965, 4-9

TOPIC TAGS: power plant component, low alloy steel, heat resistant steel, pearlitic steel

ABSTRACT: Considering the exceptionally long service life of power generating equipment (at least 10-15 years), its high operating parameters (as much as 580°C and 255 atm) and the trend toward building increasingly larger boiler-turbine units, the problem of improving the quality and durability of the components and elements of this equipment is of special importance. Currently the weight of individually cast turbine elements reaches 22-25 tons, and the wall thickness of steam lines reaches as much as 65-72 mm while their diameter may even exceed 400 mm. Under these conditions the assurance of uniform structure and properties is a particularly difficult task during various operations involved in the hot and cold working of power-machinery elements: tube bending, welding, welding-up of casting defects, and subsequent heat treatment. Proper batching of the melt is also essential, since even minor deviations

UDC: 669.14.018

Card 1/2

L 48121-85 EWT(m)/EWA(d)/EWP(t)/EWP(z)/EWP(b) - M.W./JD

ACCESSION NR: AP5008822

S/0096/65/000/004/0058/0053

AUTHORS: Petropavlovskaya, Z. N. (Candidate of technical sciences); Bogomol'naya, R. B. (Engineer)

TITLE: Low alloy reinforcing steel for large capacity power plants

SOURCE: Teploenergetika, no. 4, 1965, 58-63

TOPIC TAGS: steel alloy, perlitic steel, steel property/ 25KhMFBR steel, EPLH steel

ABSTRACT: A new type (25KhMFBR) (EPLH) of perlitic steel which may be used as reinforcing steel at temperatures up to 580C was developed, as reported by T. I. Bolikova and E. N. Petropavlovskaya (Sbornik TsNIITMASH, No. 105, 1962). The properties of this steel were investigated on 1000-2000 mm long and 100, 170, and 220 mm diameter specimens made of two slightly different alloys having the following compositions respectively (% weight): C-0.20 and 0.32; Si - 0.14, 0.12; Mn - 0.41, 0.64; Cr - 1.38, 1.12; Mo - 0.97, 0.9; V - 1.0, 1.1; Nb - 0.11, 0.12; B - 0.0044, 0.0045; Ni - 0.12, 0.09; S - 0.020, 0.022; P - 0.021, 0.017. The mechanical properties including yield stress, tensile stress, elong-

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15
14
B

L 48121-65

ACCESSION NR: AP5008822

gation, relaxation, fatigue, and prolonged stress life were determined as a function of temperature (20-580C) and heat treating method. It was found that optimum heat treatment consists of normalizing at 1050C, step-wise tempering at 600C for 3 hours and 725C for 6 hours. This provides sufficient properties for use at temperatures to 565C. Relaxation after 10 000 hours at 565C is above 10 kg/mm² for an initial stress of 30 kg/mm², the rupture stress for 20 000 hours is > 20 kg/mm². Other properties at 565C are: $\sigma_b = 75 \text{ kg/mm}^2$, $\sigma_{0.2} = 70$, $\delta = 17\%$, $\psi = 64\%$, $a_k = 8 \text{ kgm/cm}^2$. Strength properties after 6000 hours at 580C do not decrease by more than 20%. Orig. ext. has: 10 figures and 3 tables.

ASSOCIATION: TARITMASH

SUBMITTED: 00

ENCL: 00

SUB CODE: IM

NO REF SOV: 002

OTHER: 002

Card *NR* 2/2

L 8661-65 EWT(a)/EWF(b) ASD(d)/ASD(x)-2/APETA/ESD(dp)/APPC/APNJ/SSD/ASD(m)-2/
 RAFT(t)/RAEM(t) JD 8/0120/64/000/008/0001/0005
 ACCESSION NR: AP4044131

AUTHOR: Mirkin, I. L., Petropavlovskaya, Z. N.

TITLE: The effect of ferrite composition on the relaxation resistance of chromium steel

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 8, 1964, 1-5, and insert facing p. 24

TOPIC TAGS: steel, chromium steel, ferrite, ferrite composition, relaxation resistance, stress relaxation, hardness, stainless steel

ABSTRACT: Stress relaxation was studied in samples of Cr-Mo-V steel at 525-565C after normalization from 1050-1100C and tempering at 700C, in an attempt to establish a relationship between relaxation-resistance and ferrite composition. The steel samples, having a ferrite structure, contained 0.04-0.06% C, 1.14-10.03% Cr, 0.58-0.68% Mo, 0.16-0.27% V, with slightly lower amounts of the elements in the ferrite phase. The study included: a. measuring the bonding forces in the lattice of α -iron from the characteristic temperature, b. investigating recrystallization in deformed metal by measuring ferrite microhardness after cold working with subsequent heating (as shown in Fig. 1 of the Enclosure), and c. determining the recrystallization temperature from hardness curves after tempering. The results indicate that a sufficiently low rate of diffusion linked with Card1/4

E 8668-65

ACCESSION NR: AP4044131

chromium alloying is a necessary condition for high relaxation resistance in this type of steel. The highest relaxation resistance, as indicated in Fig. 2 of the Enclosure, is shown by a steel whose ferrite contains 0.5% Mo, 0.1% V and 1.0 or 10.0% Cr. "G. P. Kuznetsov directed the determination of the characteristic temperature at the Chernovitskiy gosudarstvennyy universitet (Chernovitsy State University)." Orig. art. has: 4 figures and 1 table.

ASSOCIATION: TsNITMASH

SUBMITTED: 00

ENCL: 02

SUB CODE: MM

NO REF NOV: 000

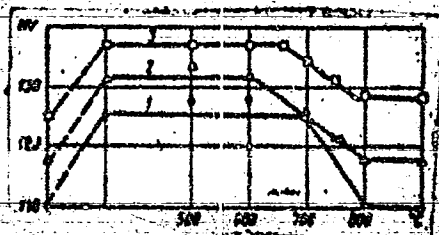
OTHER: 000

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8668-65

ACCESSION NO: AP4044181

ENCLOSURE: 01



Annealing, work-hardening
Temperature of heating

Fig. 1. Microhardness of ferrite vs temperature of heating after cold working. Ferrite

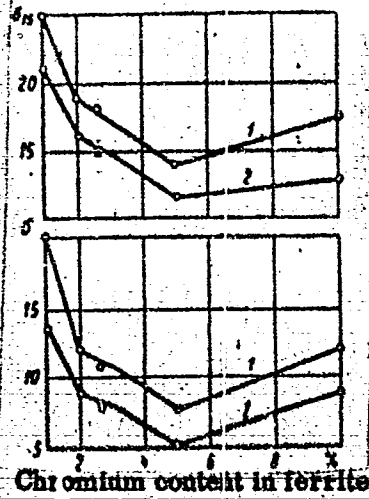
Card 3/4

E 8668-65

ACCESSION NR: AP4044131

Residual

Residual stress



ENCLOSURE: 02

Fig. 2. 15- and 2000-hrs. relaxation resistance at 525 (1) and 500C (2) of ferrite with

PETROPAVLOVSKAYA, Z.M., kand.tekhn.nauk; BORZDYKA, A.N., doktor tekhn.nauk;
MERLINA, A.V., inzh.

Properties of relaxation-resistant Kh12V2BF8 (E1003) steel.
Metalloved. i term. obr. met. no.7:34-37 J1 '62. (MIRA 15:6)

1. Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii
i mashinostroyeniya i Tsentral'nyy nauchno-issledovatel'skiy
institut chernoy metallurgii.
(Chromium-vanadium steel--Thermal properties)

VOLKOVA, T.I., kand.tekhn.nauk; PETROPAVLOVSKAYA, Z.N., kand.tekhn.nauk

Pearlite EP44(TsZhl0) steel with relaxation resistance at
temperatures ranging from 565 C to 600 C. Energomashinostroyeniye
8 no.1:33-36 Ja '62. (MIRA 15:3)
(Steel--Testing)

MIRKIN, I.I., doktor tekhn.nauk, prof.; PETROPAVLOVSKAYA, Z.N., kand.tekhn.
nauk

Dependence of the stress relaxation process in steel on the
degree of ferrite alloying. [Trudy] TSNIITMASH 105:12-29 '62.
(MIRA 15:8)

(Steel alloys--Metallography) (Strains and stresses)

VOLKOVA, T.I., kand.tekhn.nauk; PETROPAVLOVSKAYA, Z.N., kand.tekhn.nauk

Pearlitic steel for fastenings on power plant equipment with
an operating temperature of 565-600 . [Trudy] TSNIITMASH
105:9^P 107 '62. (MIRA 15:8)
(Steel, Heat-resistant) (Steam turbines)

S/590/62/105/000/007/015
1031/1242

AUTHORS: Volkova, T.I., and Petropavlovskaya, Z.N., Candidates
of Technical Sciences.

TITLE: Perlitic steel for joints in power equipment operating
at temperatures of 565-600°C

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut
tekhnologii i mashinostroyeniya. Trudy. v.105, 1962,
98-107

TEXT: The development of perlitic steels with a relaxation constant
of at least $10^4 \text{ sec} = 10 \text{ kg/mm}^2$ at 565°C is difficult. Two spe-
cimens of perlitic steel 25X 1M 1 1 (25Kh 1M 1F 1BR), a labora-
tory alloy 10 (TsZh10) and an industrial alloy 44 (EP 44)
were heated to 1100°C, then air-cooled, and tempered at 730°C for
5 hours. As a result of the high tempering temperature, Brinell
hardness dropped to 230 but the desired structural stability and
creep behavior were achieved. The EP44 specimens have a sorbite

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39629
S/129/62/000/007/004/008
E193/E383

18.1130

AUTHORS: Potropavlovskaya, Z.N., Candidate of Technical Sciences, Borzdyka, A.N., Doctor of Technical Sciences and Merlina, A.V., Engineer

TITLE: Properties of steel X12VMBF (34.993) (Kh12VMBFR(EI993)) with a high relaxation stability

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, no. 7, 1962, 34 - 37

TEXT: The steel Kh12VMBFR (composition, %: 0.17 C, 0.34 Mn, 0.22 Si, 12.6 Cr, 0.40 Mo, 0.70 W, 0.25 V, 0.5 Nb, 0.10 Ni) has been developed as a relaxation-resistant material for service at temperatures up to 600 °C and the object of the present investigation was to study the effect of several factors on its mechanical properties. The experiments were carried out on samples of laboratory and industrial-scale melts, both with and without boron additions. No difficulties were experienced in fabricating this steel (hot forging at 1 150 - 850 °C, hot rolling at 1 200 - 850 °C). The optimum hardening procedure for both B-bearing and B-free specimens was holding at 1 150 °C for Card 1/4

S/129/62/000/007/004/003
E193/E383

Properties of

30 min and oil-quenching. The tempering temperature was chosen from data on the effect of tempering temperature on hardness of the steels studied, after which the effect of various heat treatments, entailing tempering at 650 - 720 °C with or without subsequent ageing for 3 000 hours at 600 °C, on the mechanical properties of these steels at 20 and 565 °C was determined. Stress relaxation was studied at 550 - 600 °C on ring specimens under an initial stress of 30 or 35 kg/mm²; the suitability of various specimens for high-temperature service was assessed from results of these experiments extrapolated to t = 10 000 hours, which represents the time between major overhauls of boiler and steam-conduit plants. Finally, the stress-to-rupture of the steel at 565 and 600 °C was determined on both smooth and notched test pieces. Several conclusions were reached.

1) Steel Kh12VMBFR has a high relaxation stability and creep resistance at 550 - 580 °C. After 10 000 hours the initial stress of 30 kg decreases to 10 - 12 kg/mm² at 565 °C and to 9 - 10 kg/mm² at 580 °C, the stress-to-rupture in 10 000 hrs

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Properties of

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at 565 °C amounting to 26 - 28 kg/mm².
2) The best combination of mechanical properties both at room and elevated temperatures is achieved after a heat-treatment which entails oil-quenching from 1 150 °C and 3 hours tempering at 680 - 700 °C; typical values obtained after this treatment are given below:

	Yield ₂ pt., kg/mm ²	UTS, ₂ kg/mm ²	Elong- ation, % At 20 °C	Reduction in area, %	Impact strength, kg/mm ²
Annealing 1150 °C Tempering 650 °C	79	95	14.0	52.0	6.0
			<u>At 565 °C</u>		
Annealing 1150 °C Tempering 650 °C	55	59	16.0	65.0	14 .

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Properties of

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- 3) The mechanical properties of steel Kh12VMBFR are not affected by addition of B. Prolonged (3 000 hours) ageing at 600 °C brings about a slight decrease in the strength of this steel which, however, is still above the specification limit ($\sigma_{0.2} \geq 40 \text{ kg/mm}^2$).
- 4) Steel Kh12VMBFR can be recommended as material suitable for bolts and pins used to join or secure various parts of steam turbines and boilers made of ferritic and martensitic steels, provided that the thermal-expansion coefficients of these steels are similar. There are 4 figures and 3 tables.
- ASSOCIATIONS: TsNIITMASH
TzNIICHM

Card 4/4

37833

S/123/62/000/008/005/016
A004/A101

18.11.00

AUTHOR: Petropavlovskaya, Z. N.

TITLE: Improving the relaxation strength of the 25X2M1Φ (3M 723) [25Kh2M1F (EI723)] grade steel at a temperature of 565°C

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 8, 1962, 19, abstract 8A125 (V sb. "Issled. novykh zharoprochn. splavov dlya energetiki". Moscow, Mashgiz, 1961, 130-140)

TEXT: The author presents the result of research work to study the possibility of increasing the relaxation strength of the 25Kh2M1F grade steel by way of additional alloying with carbide-forming elements: Nb (0.2 - 0.9%), Ti (0.3%) and Zr (0.3%). The specimens were subjected to normalizing (at 1,100°C) and high tempering (660 - 680°C) to secure optimum heat-resistant properties. The relaxation strength of the steel was evaluated from the stress drop magnitude during 1,000, 4,000 and 10,000 hours. It was found that only Nb effectively increases the relaxation resistance of the steel. Ti and Zr accelerate the stress relaxation process.

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

X

S/137/62/000/004/117/201
A052/A101

18 1156
AUTHOR: Petropavlovskaya, Z. N.

TITLE: Raising relaxation resistance of 25X2M1Φ (25Kh2M1F) [ЭИ 723 (EI723)] steel at 565°C

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 4, 1962, 54, abstract 4I317 (V sb. "Issled. novykh zharoprochn. splavov dlya energetiki". Moscow, Mashgiz, 1961 130 - 140) — No 161

TEXT: An addition to 25Kh2M1F steel of strong carbide-forming elements (Nb, Ti and Zr) up to 1% leads to qualitatively different changes in the rate of the stress relaxation process. Only Nb has an effective influence on the increase of the relaxation resistance of the steel; Ti and Zr contribute to a considerable acceleration of the stress relaxation process. This is explained by the fact that only an additional alloying of this steel with Nb makes it possible to produce a sufficient strengthening of ferrite with Mo and the highest carbide phase stability, which is secured by the presence of Nb carbides. 25X2M1ΦE (25Kh2M1FB) steel containing 0.2 - 0.4% Nb after normalizing at 1,100°C and tem- ✓B

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Raising relaxation resistance of...

S/137/62/000/004/117/201
A052/A101

pering at 660°C has higher relaxation resistance characteristics at 550 - 565°C compared with 25Kh2M1F steel containing no Nb. There are 10 references.

T. Rumyantseva

[Abstracter's note: Complete translation]

Card 2/2

36816
S/137/62/000/004/116/201
A052/A101

1P.1150

AUTHORS: Borzdyka, A. M., Petropavlovskaya, Z. N., Merlina, A. V.

TITLE: Relaxation-resistant chromium steel for fasteners of steam turbines

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 4, 1962, 53 - 54, abstract 4I316 (V sb. "Issled. novykh zharoprochn. splavov dlya energetiki". Moscow, Mashgiz, 1961, 141 - 150) - No. 101

TEXT: As a fastening material for steam turbines with the temperature of steam of 565 and 580°C, 20X12M8HΦ (20Kh12MVBF) Cr-steel can be used. This steel is recommended for fastening steam turbine and boiler elements made of 3X802 (E1802), 15X11Л (15Kh11L) and other type steels. 20Kh12MVBF steel after oil hardening at 1,150°C and tempering at 680 - 700°C has a sufficiently high relaxation resistance and a long-time strength at 550 - 580°C and shows no sensitivity to notches. The residual stress value after 10,000-hour testing of ring samples of this steel at 565°C corresponds to the technical conditions for fastening materials and is equal to 10 kg/mm² at $\sigma_0 = 30$ kg/mm² and at 580°C it amounts to 9.5 kg/mm².

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

T. Rumyantseva

34667
S/114/62/000/001/004/006
E193/E383

18.1150

AUTHORS:

Volkova, T.I. and Petropavlovskaya, Z.N. Candidates of
Technical Sciences
Pearlitic steel EP44 (L, *10) (EP44(TsZh10))

TITLE:

Energomashinostroyeniye, no. 1, 1962. 33 - 36

TEXT:

Metallovedeniye i termicheskaya obrabotka metallov, no. 2, 1961)
the present authors studied the high-temperature properties of
steel 25Kh1M1F1B (25Kh1M1F1B) designed as a material for
reinforcing details of turbines operating at 565 °C. A tenta-
tive code mark, TsZh10, has been allotted to this steel which,
in industrial practice, is known as steel EP44. The chemical
analysis is given in Table 1. The optimum treatment of this
steel consisted of heating to 1 100 °C, air-cooling and
tempering for 5 hours at 730 °C, high-temperature tempering
being necessary to ensure relaxation stability in service.
After this treatment the steel constituted a mixture of ferrite
with uniformly distributed coarse carbide particles. Some
mechanical properties of the steels studied are given in
Table 2. The results of relaxation tests, carried out in the
Card 1/3

S/114/62/000/001/004/006
E193/E383

Pearlitic steel

course of the present investigation on ring specimens at 565, 580 and 600 °C, are reproduced in Table 3, the values in brackets being obtained by extrapolation which, as had subsequently been established, gave values slightly lower than the actual. The temperature dependence of the relaxation stability is shown in Fig. 4, where the stress

(σ , kg/mm²) after 10 000 hours is plotted against test temperature (°C), the experimental points denoted by crosses, dots and triangles relating, respectively, to a specimen of a laboratory melt (TsZh10) tested under an initial stress $\sigma_0 = 30$ kg/mm², a specimen of an industrial melt (EP44), tested under $\sigma_0 = 30$ kg/mm² and a specimen of EP44 tested under $\sigma_0 = 25$ kg/mm²; the broken horizontal line corresponds to the value of σ , as specified in TU. The results of creep tests carried out at 565 °C on cylindrical specimens (10 mm in diameter, 100 mm gauge length) normalized at 1 100 °C and

Card 2/9

PETROFAYLOVSKAYA, Z.N., kand.tekhn.nauk

Investigating the relaxation stability of steam-turbine
materials. [Trudy] TSNIITMASH 100:238-247 '59.

(MIRA 13:7)

(Strains and stresses)
(Steam turbines)

SOV/129-59-5-10/17

AUTHORS: Cand. Tech. Sci. Z.N. Petropavlovskaya; Dr. Tech. Sci.
A.M. Borzdyka; Engineer A.V. Merlina

TITLE: Relaxation Stability of High Chromium Steel
(Relaksatsionnaya stoykost' vysokokhromistoy stali)

PERIODICAL: Metallovedeniye i Termicheskaya Obrabotka Metallov
1959, Nr 5, pp 45-50 + 1 plate (USSR)

ABSTRACT: The results are described of investigations of the process of relaxation of high chromium semi-ferritic steels (0.10 - 0.15% C; 10 - 12% Cr; 0.3 - 0.6% Mo) as a function of their degree of alloying and their phase state. The work hardening was effected by alloying of the base alloy with vanadium, tungsten, molybdenum, niobium and nickel. To detect as fully as possible the influence of these elements on the relaxation stability, the experimental melts were sub-divided into four groups, see Table 1. The metal was produced in a 50 kg capacity induction furnace with a basic lining from a charge consisting of chemical iron and pure ferro-alloys. The relaxation tests lasted 1500 to 4000 hours and these were carried out at 550 to 565 °C with an initial specific load of 25 to 30 kg/mm². The relaxation stability was

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SOV/129-59-5-10/17

Relaxation Stability of High Chromium Steel

judged from the residual stress after 4000 hours. For most heats this magnitude was determined experimentally. The influence of individual alloying elements on the relaxation stability can be judged from the graphs (Figs 1-4). Table 2 gives the phase composition of the steel from the melts investigated in the experiments. The following conclusions are arrived at: 1) Additional alloying of steel, containing 0.15% C, 12% Cr, and 0.5% Mo, with vanadium (up to 0.4%), tungsten (up to 0.8%) and niobium (up to 0.8%), introduced separately or together, brings about an increase of the relaxation stability of the base alloy. From the point of view of increasing the resistance to relaxation the most effective measure is to add simultaneously all the three elements. 2) The relaxation stability of the investigated steels depends to a great extent on the quantitative ratio of the structural components (sorbite and ferrite) and also on the degree of hardening and the stability of ferrite. In order to obtain a high relaxation stability, alloying of high chromium steel should ensure a high strength of the ferrite and the highest stability of the ferrite and

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SOV/129-59-5-10/17

Relaxation Stability of High Chromium Steel

carbide phases. 3) For "fastening" components (fittings) which are required to have satisfactory relaxation properties at 565 °C, steels of the following two compositions are recommended: (1) 0.2% C; 12% Cr; 0.8% Mo; 0.3% V; 0.8% Nb; and (2) 0.2% C; 12% Cr; 0.5% Mo; 0.4% V; 0.5% W and 0.5% Nb.

Card 3/3 There are 4 figures, 2 tables and 6 references, 4 of which are Soviet and 2 English.

ASSOCIATIONS: TsNIITMASH and TsNIChM

SOV/124-58-5-6132

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 5, p 156 (USSR)

AUTHOR: Oding, I.A., Petropavlovskaya, Z.N.

TITLE: Effect of Heat Treatment on the Relaxation Stability of Austenite Steels (Vliyaniye termicheskoy obrabotki na relaksatsionnuyu ustoychivost' austenitnoy stali)

PERIODICAL: V sb.: Ispytaniya i svoystva zharoprochn. materialov. Moscow, Mashgiz, 1957, pp 61-80

ABSTRACT: EI388, EI402, and EI448 - grades of steels were investigated. The heat treatment consisted of quench-hardening with ensuing single-stage or multistage aging. Microstructural, phase, X-ray, and chemical methods of analysis were employed. Investigations revealed that the relaxation resistance of steels is dependent upon the condition of the solid solution and the carbide phase and on the interaction of these phases. It is demonstrated that by varying the process of the stabilizing anneal relaxation resistance can be raised or lowered. In order to obtain structurally stable austenite steels application of multistage aging is recommended as a means of increasing the long-term service strength. G.A. Tulyakov

Card 1/1

1. Steel--Stability 2. Steel--Heat treatment 3. Steel--Analysis

AUTHOR: Petropavlovskaya, Z. N., Candidate of Technical Sciences 129-58-7-14/17

TITLE: Effect of Heat Treatment on the Notch Sensitivity of Chromium-Molybdenum-Vanadium Steel (Vliyaniye termooobrabotki na chuvstvitel'nost' k nadrezu khromomolibdeno-vanadiyevoy stali)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, Nr 7 pp 54-58 (USSR)

ABSTRACT: The influence of heat treatment is investigated on the notch sensitivity of the Soviet Cr-Mo-V Steel EI723 (0.25% C, 2.3% Cr, 0.99% Mo, 0.45% V, 0.60% Si, 0.35% Mn) quoting also comparative results obtained by Newmann Jones and Sachs (Ref.4). On the basis of the results obtained by the author on the Soviet steel EI723 and the quoted results obtained for the American steel 17-22A (S), the following conclusions are arrived at:

- 1) Heat treatment of Cr-Mo-V steels has an extremely great influence on the notch sensitivity during long duration strength tests.
- 2) By appropriately choosing the heat treatment regimes it is possible to weaken the notch sensitivity and to impede the embrittlement of Cr-Mo-V steel. For a steel

Card 1/2

Effect of Heat Treatment on the Notch Sensitivity of
Chromium-Molybdenum-Vanadium Steel ^{129-58-7-14/17}

with 1.5 to 2.5% Cr, 0.5 to 1% Mo and 0.2 and 0.5% V the following heat treatment is rational: twice normalisation annealing carried out at first at a high temperature (1040°C) and then at a lower temperature (960°C) followed by high temperature tempering at 680°C. There are 5 figures, 1 table and 5 references, 2 of which are Soviet, 3 English.

ASSOCIATION: TsNIITMASH.

Card 2/2

PETRO^{DA}VLOVSKAYA, Z.N., kand. tekhn. nauk

Effect of heat treatment to notch sensitivity of chromium-
molybdenum-vanadium steel, Metalloved. i obr. met. no. 7:54-58
J1 '58. (MIRA 11:8)

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

(Chromium-molybdenum-vanadium steel-Testing)
(Metals, Effect of temperature on)

Петропавловская, З. Н.

137-1957-12-25046

Translation from: Referativnyy zhurnal, Metallurgiya, 1957, Nr 12, p 302 (USSR)

AUTHOR: Oding, I. A., Petropavlovskaya, Z. N.

TITLE: The Effect of Heat Treatment on the Relaxation Stability of Austenite Steel (Vliyaniye termicheskoy obrabotki na relaksatsionnyuyu ustoychivost' austenitnoy stali)

PERIODICAL: V sb.: Ispytaniya i svoystva zharoprochn. materialov
Moscow, Mashgiz, 1957, pp 61-80

ABSTRACT: An investigation of the effect of various heat treatment procedures on the heat resistance properties of austenite steels and, in particular, on their relaxation stability (RS). Specimens of the EI388, EI402, and EI448 steels, in the shape of forged and rolled rods, were quenched and then subjected to either single-stage or multi-stage aging (A), which was carried out in accordance with one of two procedures. In the first version the initial heating took place at a temperature below that of the second heating, but with longer exposures (100-500 hrs), in order to prepare the solid solution for the subsequent separation of phases and to create a large number of submicroscopic nuclei. The RS was studied on annular specimens by means of the method

Card 1/3

137-1957-12 25040

The Effect of Heat Treatment on the Relaxation Stability (cont.)

of I. A. Odling; prior to the test the magnitude of E at various temperatures was determined for all grades of steel by electronic means. In addition, the influence of the conditions of A on the mechanical properties and on microstructural changes in austenite steels was also investigated. It is shown that the RS of the steels considered depends on the state of the solid solution and of the carbide phases, as well as of their dispersion and the interaction between them. The less stable the solid solution and the smaller the amount of the hardening phases, the lower the RS. An analogous effect is produced by an increased degree of dispersion of the particles which are separated out and an increased non-uniformity of their distribution. The multi-stage conditions of stabilizing A strongly influences the formation of hardening phases. Under repeated heating further deposition of carbides upon the already formed submicroscopic crystallization nuclei is observed in the multi-stage A process; thus the hardening phases are distributed more uniformly and are more finely dispersed than in the case of single-stage A , which explains the improved RS observed in the EI402 steel after it has been exposed to multi-stage A . In the EI388 and EI488 steels the formation of phases is retarded in the course of multi-stage A , which results in a

Card 2/3

137-1957-12-1504r

The Effect of Heat Transfer on the Relaxation Stability (cont.)

reduced stability of the solid solution and in a lower RS. This is explained by the presence of cubic Cr carbide in these steels, which can change its composition within a rather wide range and is capable of reacting with the solid solution, thus reducing the stability of the metal structure. The employment of multi-stage A is recommended as a means of increasing the strength of structurally stable austenite steels, operating for a long time under conditions which cause relaxation.

L. G.

1. Austenitic steel-Stability-Effects of heat treatment
2. Austenitic steel-Properties-Temperature factors

Card 3/3

L 20800-65 EWP(m)/EPP(n)-2/T/EWP(t)/EWP(b) Pu-4 ASD(x)-3/ASD(y)-3/RAEM(c)/
 EPP(c) JO/JO S/0277/64/000/008/0013/0013
 ACCESSION NR: AR4017536

SOURCE: Ref. zh. Mashinostr. mat., konstr. i raschet detal. mash.
 Otd. vosp., Abs. 8.48.81

AUTHOR: Borzdyska, A. M.; Petrouavlovskaya, Z. P.; Merlina, A. V. ⁶

TITLE: The effect of alloying elements on the relaxation stability
 of high chromium steels ¹⁸

CITED SOURCE: Sb. Legirovaniye staley. Kiyev, Gostekhnizdat USSR,
 1963, 142-150

TOPIC TAGS: relaxation stability, relaxation, alloying, chromium
 steel, ferritic steel, vanadium, tungsten, niobium, molybdenum,
 phase composition _{27 27 27}

TRANSLATION: The relaxation stability of high chromium steels of the
 semiferritic type (0.10-0.15% C, 10-12% Cr, 0.3-0.6% Mo) was studied
 as a function of their degree of alloying with V and W and of the
 phase composition. The samples were quenched in oil and subjected to
 a high annealing. Relaxation tests were carried out on Oding annular
 samples at 550-5650 for a period of 4000 hrs. Steel with 12% Cr and
 Card 1/2

L 20800-65

ACCESSION NR: AR4047536

0.5% Mo, taken as a standard, has low relaxation stability. The optimum relaxation stability is observed in semiferritic steel with 12% Cr, 0.5% Mo and 0.4% V, with an additional alloying with W within the limits of 0.3-0.5%; in this case, the C content should not exceed 0.15-0.20%. Introduction of Nb shows effective action on relaxation stability: relaxation stability increases twofold on the introduction of Nb up to 0.7% (with 0.15% C). However, the effectiveness of Nb action in raising the relaxation stability of high chromium steels depends to a great degree on the content of other alloying elements. Thus, an increase in the Mo content to 1.3% (from 0.7%) in steel with 12% Cr, 0.4% V, and 0.7% Nb leads to a decrease in relaxation stability.

SUB CODE: MM

ENCL: 00

ord 2/2

L 14008-65 EWT(m)/ENA(d)/EWP(t)/EWP(b) ASD(m)-3/ASD(f)-2 JD
ACCESSION NR: AR4045893 S/0137/64/000/007/I065/I065

SOURCE: Ref. zh. Metallurgiya, Abs. 71407

AUTHOR: Borzdyaka, A. M.; Petrovaylovskaya, Z. P.; Merlina, A. V.

TITLE: The effect of alloying elements on the relaxation stability of high chromium steels

CITED SOURCE: Sb. Legirovaniye staley. Kiyev, Gostekhizdat USSR, 1963, 142-150

TOPIC TAGS: alloying, relaxation, high chromium steel, chromium steel, Cr, V, W, C, Mo, Nb, Nb carbide, ferritic steel, steel

TRANSLATION: The relaxation stability of high chromium steels of the semiferrite type (0.10-0.15% C, 10-12% Cr, 0.3-0.6% Mo) was studied as a function of their degree of alloying and phase state. The samples were quenched in oil and subjected to a high tempering. Relaxation tests were carried out on ring shaped Odling samples at 550-565°. The duration of the tests was 4,000 hours. Steel with 12% Cr and 0.5% Mo, taken as a base, has a low relaxation resistance.

Card 1/3

L 14GD8-65

ACCESSION NR: AR4045893

Alloying of steel with vanadium (up to 0.6%) somewhat improves its relaxation stability. Further increase in the content of V up to 1% leads to a decrease in relaxation stability; for this reason, the alloying of high chromium steels with vanadium should be limited to 0.3-0.6%. The introduction of W (up to 1%) into steel with 12% Cr, 0.5% Mo, and 0.45% V somewhat increases the relaxation stability; however, further increase in the W content increases the speed of the relaxation process. With an increase in C content, and at the same time of Mo and C, in steel with 12% Cr and 0.4% V, the nature of the effect of W is retained. Increased content of Mo from 0.3 to 0.7% in steel with 12% Cr and 0.4% V, alloyed with W (up to 1%), increases relaxation stability. An optimum relaxation stability is observed in semiferrite steel with 12% Cr, 0.5% Mo, and 0.4% V, with a supplementary alloying with W within the limits 0.3-0.5%; at the same time, the C content should not exceed 0.15-0.20%. An increase in the content of C from 0.15 up to 0.4% in steel with 12% Cr and 0.5% Mo, alloyed with V, or with W and V, leads to a martensite structure of the steel, which lowers relaxation stability. The introduction of Nb up to 0.7% (with 0.15%C) has an efficient effect on relaxation stability, which increases two fold. However, the efficiency of the

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I 14008-65

ACCESSION NR: AR4045893

action of Nb in raising the relaxation stability of high chromium steels depends to a high degree on the content of the other alloying elements. Thus, an increase in the content of Mo up to 1.3% (with 0.7%) in steel with 12% Cr, 0.4% V, and 0.7% Nb, leads to a decrease in relaxation stability. The increase in relaxation stability of steels with the introduction of Nb is due to the formation of stable Nb carbides, whose presence brings about a high stability of the ferrite.

SUB CODE: MM

ENCL: 00

Card 3/3

PETROPAVLOVSKIY, A.; TAIROV, N.

Standardizing combined feeds and improving their quality.
Standartizatsia 29 no.7:31-32 J1 '65. (MIRA 18:11)

PETROPAVLOVSKIY, A.A., kand.tekhn.nauk, dotsent

Study of the stability and natural oscillations of three-dimensional
arched systems. Trudy MIIT no.134:12-23 '61. (MIRA 15:5)
(Arches)

PETROPAVLOVSKIY, A.A. (Moskva)

Three-dimensional vibrations of an arched span with traffic in
the middle. Stroi. mekh. i rasch. soor. 4 no.2:41-45 '62. (MIRA 19:5)

(Bridges, Arched) (Vibration)

PETROPAVLOVSKIY, A.A., doktor tekhn. nauk

Verifying the spatial stability of continuous combined arch
spans. Issl. po teor. sooruzh. no.13:173-181 '64. (MIRA 18:2)

PETROPAVLOVSKIY, A.A., doktor tekhn. nauk, dotsent

Matrix algorithm for deriving the values of special functions
of the transposition method. Trudy MIIT no.174:49-51 '63.
(MIRA 18:1)

KOLOUSHEK, Vladimir [Koloušek, Vladimir], doktor tekhn. nauk,
prof.: BABUSHKA, I. [Babuška, I.]; GENRIKH, I. [Henrich, I];
YERZHABEK, Ya. [Jefabek, J.]; NOVAK, M.; RYCHAGO, G.D., inzh.
[translator]; YAKUSHEVA, G.A., inzh. [translator];
PETROPAVLOVSKIY, A.A., doktor tekhn. nauk, prof., red.

[Structural dynamics. Translated from the Czech] Dinamika
stroitel'nykh konstruktsii. Moskva, Stroiizdat, 1965. 631 p.
(MIRA 18:5)

1. Chlen-korrespondent AN Chekhoslovatskey Sotsialisticheskoy Respubliki (for Koloushek).

PETROPAVLOVSKIY, A.A., dotsent, kand.tekhn.nauk

Strength analysis and the determination of natural vibration frequencies for a combined two-floor three-span arch system of the type of the river span structure of the Luzhniki Subway Bridge. Trudy MIIT no.3:132-159 '61. (MIRA 14:5)

(Trusses--Vibration)

ANDREYEV, V.G.; PETROPAVLOVSKIY, A.A. (Moskva)

Designing the river span of the subway bridge in Lushniki.
Stroi.mekh.i rasch.scor. 1 no.5:35-40 '59. (MIRA 13:1)
(Moscow--Bridges--Design)

124-58-9-10452

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 9, p 147 (USSR)

AUTHOR: Petropavlovskiy, A. A.

TITLE: The Influence of the Behavior of a Loading on the Magnitude of the Stability Coefficient of Bridge Arches (Vliyaniye povedeniya nagruzki na velichinu koeffitsiyenta ustoychivosti mostovykh arok)

PERIODICAL: Tr. Mosk. in-ta inzh. zh.-d. transp., 1957, Nr 91, pp 103-116

ABSTRACT: Determination of the influence of the changes in direction of the vertical web members, during the process of failure of an entire arch structure, upon the magnitude of the critical force that corresponds to the failure of a plane arch equipped with a stiffening beam (the superstructure of a spandrel-braced arch or the suspended chord beam of a bow-string arch). Five types of structural configurations of the connection of the arch proper with the stiffening beam, both with a hinged and a continuous roadway, are examined. The problem is solved by means of successive approximation, wherein matrix symbolics and terminology are employed. Having given the displacement of some points of the axis of the arch, the author determines the corresponding bending moments in the various sections of the arch, whereupon he

Card 1/2

124-58-9-10452

The Influence of the Behavior of a Loading on the Magnitude (cont.)

obtains "elastic loads" and therefrom determines the displacements of the points of the axis of the arch in the subsequent approximation. The process is continued until two successive approximations are sufficiently close relative to the desired parameter. The results of numerical calculations adduced show that the mode of connecting the arch and the stiffening beam and the respective behavior of the connecting beams during the course of the process of failure exert a noticeable influence on the magnitude of the critical force and that they must, therefore, be taken into consideration in actual engineering design projects. Bibliography: 22 references.

K. B. Aktsentyan

1. Bridges--Stresses
2. Bridges--Mathematical analysis

Card 2/2

18(7); 14(10)

PHASE I BOOK EXPLOITATION

SOV/2957

Petropavlovskiy, Andrey Aleksandrovich, Candidate of Technical Sciences,
Docent

Osnovy rascheta tonkostennykh sterzhney otkrytogo profilya po teorii professora V.Z. Vlasova; lektsiya ilya studentov stroitel'nogo i mashinostroitel'nogo fakul'tetov (Fundamentals of Analyzing Thin-Walled Bars With Open Cross Section According to Professor V.Z. Vlasov's Theory; Lecture for Students of Faculties of Civil Engineering and Mechanical Engineering) Moscow, 1958. 39 p. 2,000 copies printed.

Sponsoring Agency: Vsesoyuznyy zaachnyy politekhnicheskiy institut. Kafedra soprotivleniya materialov i stroitel'noy mekhaniki.

Resp. Ed.: A.V. Darkov, Professor, Doctor of Technical Sciences;
Ed. of Publishing House: T.I. Artemova; Tech. Ed.: P.G. Bobrov.

PURPOSE: This booklet is intended for students of construction engineering and machine building.

Card 1/3

Fundamentals of Analyzing (Cont.)

SOV/2957

COVERAGE: This booklet presents the fundamentals of torsion analysis of thin-walled bars as developed by Professor V.Z. Vlasov. A thin-walled bar is defined as one whose length is from 8 to 10 times greater than the mean cross section, and whose cross section is considerably greater than the thickness of any wall.

Vlasov's analytical approach rests on two basic hypotheses:

- 1) shear deformations of the median surface are equal to zero, and
- 2) the contour of the cross section is not deformed, i.e., the distance between any two points on the cross section remains constant as the bar is deformed. Sample problems are given.

Professor A.A. Umanskiy is mentioned as having made contributions in this field of particular interest to the aviation industry. There are 4 references: 2 Soviet and 2 German.

TABLE OF CONTENTS:

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Fundamentals of Analyzing (Cont.)

SOV/2957

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|--|----|
| 4. Derivation of a formula of tangential stresses | 14 |
| 5. Determination of the flexure center and of the initial point of sectorial areas | 16 |
| 6. Expression of normal and tangential stresses by flexure and torsion force-factors | 20 |
| 7. Computation of geometric characteristics | 25 |
| 8. Differential equation of torsion of thin-walled bars | 28 |
| 9. Sample analysis of a thin-walled bar | 33 |

AVAILABLE: Library of Congress (TG 350 .P4)

Card 3/3

AC/jb
2-16-60

PETROPAVLOVSKIY, Andrey Aleksandrovich, dotsent, kand.tekhn.nauk; DARKOV,
A.V., prof., doktor tekhn.nauk, otv.red.; ARTEMOVA, T.I., red.
izd-va; BOBROV, P.G., tekhn.red.

[Principles of the calculation of open thin-walled beams; based
on the theory of professor V.Z.Vlasov; lecture for students of the
departments of construction engineering and machinery construction]
Osnovy rascheta tonkostennykh sterzhnei otkrytogo profilja: po
teorii professora V.Z.Vlasova; lektsia dlia studentov stroitel'nogo
i mashinostroitel'nogo fakul'tetov. Pod red. A.V.Darkova. Moskva,
Vses. zaochnyi politekhn.in-t, 1958. 38 p. (MIRA 12:4)
(Girders)

Petrovskiy, M. I.
~~PETROPAVLOVSKIY, M. I.~~, kand. tekhn. nauk dots.

Effect of load behavior on the stability coefficient of bridge
arches. Trudy MIIT no.91:103-116 '57. (MIRA 11:2)
(Arches) (Bridge construction)

PETROPAVLOVSKIY, A.M.

Increasing quality requirements for the seeds of forage
pulse crops. Standartizatsiia 29 no. 11:23-24 N '65
(MIRA 19:1)

1. Kachal'nik otдела sel'skokhozyaystvennoy produktsii Vse-
soyuznogo nauchno-issledovatel'skogo instituta standarti-
zatsii, Moskva.

PETROKANSKIY, B.I.; ZVEREV, N.P., retsenzent; MIZIN, V.I.,
retsenzent; PETROV, A.I., retsenzent; KRISHTAL', L.I.,
red.; MURAV'YEVA, N.D., tekhn. red.

[Statistical accounting and the work analysis of a rail-
road division] Statisticheskii uchet i analiz raboty ot-
deleniia dorogi. Moskva, Izd-vo "Transport," 1964. 218 p.
(MIRA 17:3)

PETROPAVLOVSKIY, A.M., agronom.

Disregard of standards in seed growing inflicts enormous losses on the national economy. Standartizatsiia no.5:12-17 S-0 '54.
(MLRA 8:2)

1. Komitet standartov, mer i izmeritel'nykh priborov.
(Seeds--Standards)

PETROPAVLOVSKIY, B.M.

"Health resorts, sanatoriums and curative regions in Kazakhstan"
by S.I.Zamiatin. Reviewed by B.M.Petropavlovskii. Vop.kur.,
fizioter, i lech.fiz.kul't. 22 no.3:90-91 My-Je '57. (MIRA 11:1)
(KAZAKHSTAN--HEALTH RESORTS, WATERING PLACES, ETC.)
(ZAMIATIN, S.I.)

PETROPAVLOVSKIY, B.P.

Quality control of ballast tamping. Put' 1 pat. khoz. 7 no.10:42 '63.
(MIRA 16:12)

KUROCHKIN, G.A.; TRAVKIN, V.S.; VLADISLAVLEV, Yu.Ye.; ANTONOV, N.V.;
GUREVICH, B.M.; SHIT, Ye.B.; PETROPAVLOVSKIY, B.P.; AGHKASOV,
B.I.; BORMOTIN, I.M.

Inventions. Gor.zhur. no.2874-75 # '63. (MIRA 16:2)
(Mining machinery--Technological innovations)
(Earthmoving machinery--Technological innovations)
(Railroads--Rails)

COUNTRY : USSR
CATEGORY : Farm Animals. 9
 : Small Horned Cattle.
ABS. JOUR. : RZhBiol., No. 6, 1959, No. 25878
AUTHOR : Petrovaylovskiy, D. P.
INST. : Altay Institute of Agriculture.
TITLE : The Influence of Feeding Corn Silage upon the
 Production of Sheep.
ORIG. PUB. : Tr. Altaysk. s.-kh. in-ta, 1957, vyp. 5,
 300-309
ABSTRACT : One-hundred ewes of the Altayskaya breed were
 divided into 4 groups. The rations for the
 groups were of the same general nutritive
 value but differed in the quantity of silage
 (1-3 kg) contained in them. The control group
 was fed hay and oats only. In sheep which were
 fed silage, the wool yield increased (by 150-
 280 g), the wool became longer (by 0.17-0.31
 cm). In the group which was given 3 kg of
 silage, better digestion was observed which
 increased the nutritive value of the ration.

Card: 1/2

GAREGG, P.; LINDBERG, B.; PETROPAVLOVSKIY, G.; TEANDER, O.

Production and partial xanthation of tetrahydropyranyl- β -D-glucopyranoside.
Zhur. prikl. khim. 34 no. 12:2771-2774 D '61. (MIRA 15:1)

1. Shvedskaya issledovatel'skaya laboratoriya lesnykh produktov,
Stokgol'm.
(Glucopyranoside) (Cellulose xanthates)

PETROPAVLOVSKIY, G. A.

"Properties of the Low-Replaced Methyl Cellulose and Its Solutions." Min. Higher Education USSR, Leningrad Order of Lenin Wood Industry Academy imeni S. M. Kirov, Leningrad, 1955. (Dissertation for the Degree of Candidate in Technical Sciences)

SO: Knizhnaya Letopis'. No. 22, 1955. pp 93-105

PETROPAVLOVSKI, G. A.

3

Preparation and properties of low-substituted methyl and
 carboxymethylcellulose. I. N. I. Nikitin and G. A. Petro-
 pavlovskii. *Zhur. Priklad. Khim.* 29 (1949) 1159
 C.A. 50, 14222d low substituted methylcellulose
 was prepd. by methylation with MeI. The effect on the
 percentage of MeO and the degree of substitution (D. S.) of
 the following variables were studied: the content of the mer-
 curizing NaOH (8-36%) and of Me₂SO (0.5-15 g./g. cellulose),
 degree of polymerization (420-1000) of the original cellulose,
 temp. (0-25°) and the duration (0.56-6 hrs.) of bromina-
 tion. The best conditions (15% Me₂O) were: 8 hrs. at 15°
 with less than 1 mol. of Me₂SO/mol. of cellulose mercerize-
 with 12-18% NaOH. Low substituted Na carboxymethyl-
 cellulose (II) was prepd. by treating air-dry cellulose with a
 soln. of CH₃CO₂H (III) in NaOH so that 12-18% free
 NaOH remained after neutralization of III. The best con-
 ditions (Na content 2.95% and D. S. 23.5) were 4 hrs. at
 40° with 47% III. After swelling 15 min. at -5° and freez-
 ing 15 min. at -15° I and II were sol. in 0.5% NaOH and
 I was sol. in H₂O (concomitant mech. stirring improved the
 filtering properties). The sol. portion contained 20-31%
 MeO. I. Benecowitz

PETROPAVLOVSKIY, G. A., and NIKITIN, N. Y.

"Properties of cellulose ether solutions," a paper presented at the 9th Congress on the Chemistry and Physics of High Polymers, 2nd June-1 July 57, Moscow, Forest Research Inst.

B-3,084,395

PETROPAVLOVSKIY, G.A.

PETROPAVLOVSKIY, G.A.

Biological stability of low-substituted cellulose ethers. Zhur.prikl.
khim. 30 no.3:486-489 Mr '57. (MLRA 10:5)
(Cellulose) (Bacteria, Cellulose-decomposing)

ПЕТРОПАВЛОВСКИЙ
PETROPAVLOVSKIY, G.A.; VASIL'YEVA, G.G.

Low-substituted Na-carboxymethylcellulose and its properties
as a finish for textile products. Zhur.prikl.khim. 30 no.12:
1832-1837 D '57. (MIRA 11:1)
(Cellulose) (Textile finishing)

PETROPAVLOVSKIY, G.A.

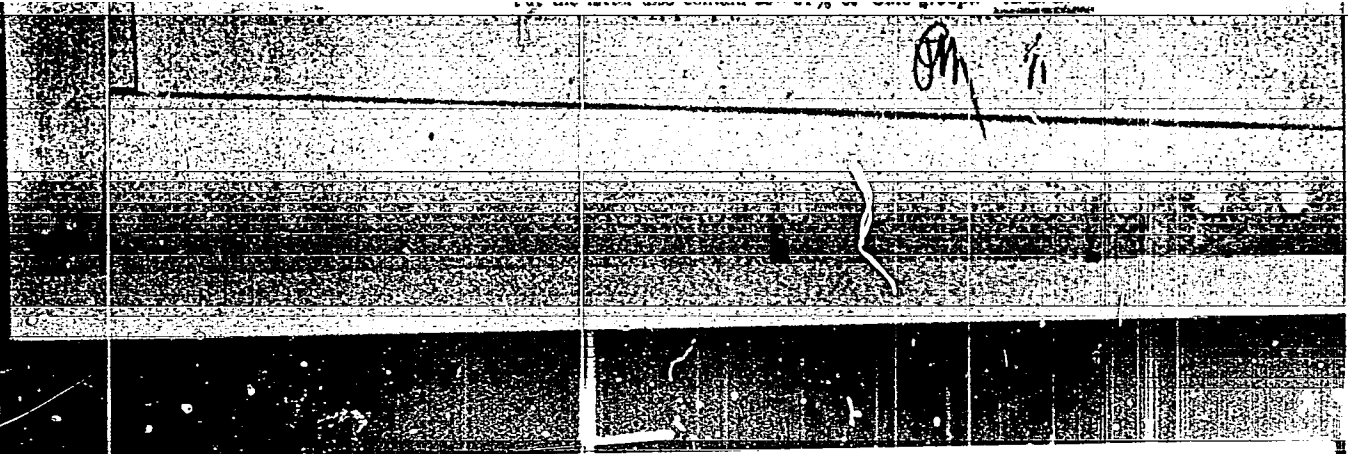
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Preparation and properties of low-substituted methylcellulose and
carboxymethylcellulose. Zhur.prikl.khim. 29 no.10:1540-1549 0 '56.
(Cellulose)

PETROPAYLEVSKIY, G. A.

Preparation and characteristics of low-substituted methyl- and carboxymethyl-cellulose. N. I. Nikitin and G. A. Petropavlovskii (Zh. Prikl. Khim., 1956, 29, 1546--1548).--Low-substituted simple and complex esters give increased reactivity and show high hydrophilic characteristics when small quantities of substituted radicals are introduced into the cellulose. The prep. and characteristics are described of low-substituted methyl- and carboxymethyl-

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7-30
MAY 1956



PETROBYLOVSKIY, G.A.; NIKITIN, N.I.

Properties of solutions of methylcellulose of low degree of
substitution. Zhur. prikl. khim. 29 no.11:1707-1716 N 1956.
(Cellulose) (MIRA 10.5)

PETROPALOVSKIY, G.A.

The biological stability of cellulose ethers with a low degree of substitution. G. A. Petropalovskiy. *Zhur. Priklad. Khim.* 30: 488-9(1957).—Fibrous cellulose ethers (methyl (I), ethyl (II), and hydroxyethyl cellulose (III)), prepd. by reaction of filter paper soaked in 18% NaOH with gasol, MeI, EtI, or CH_3CH_2O , resp., were subjected to the action of *Cytophaga*. I or II contg. 6-7% alkoxyI did not support the growth of *Cytophaga*; III contg. up to 4% hydroxyethyl (the highest content prepd.) did. I or II contg. 3% alkoxyI suffered 18-23% loss in wt., compared with 60-2% for filter paper. C. B. Fernald.

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46-48

PM

PETROPAVLOVSKIY, G.A.; KRUNCHAK, M.M.

Methods for obtaining cellulose sulfo ethers. Zhur. prikl.
khim. 36 no.11:2506-2512 N '63. (MIRA 17:1)

PETROPAVLOVSKIY, G.A.; KRUNCHAK, M.M.; VASIL'YEVA, G.G.

Low-substituted nitrates of wood celluloses. Zhur. prikl. khim.
36 no.8:1799-1808 Ag '63. (MIRA 16:11)

PETROPAVLOVSKIY, G.A.; VASIL'YEVA, G.G.; KRUNCHAK, M.M.; NIKITIN, N.I.

Properties of films of low-substituted nitrates of wood
cellulose. Zhur. prikl. khim. 36 no.8:1816-1821 Ag '63.
(MIRA 16:11)

PETROPAVLOVSKIY, G.A.; VASIL'YEVA, G.G.

Alkali soluble carboxymethyl cellulose and possibilities of its use in the paper and textile industries. Trudy LTA no.91:115-121 '60. (MIRA 15:12)

1. Lesotekhnicheskaya akademiya.
(Textile industry) (Cellulose) (Paper industry)

PETROPAVLOVSKIY, G.A.

Alkali solutions of low-substituted nitrocellulose.

Trudy LTA no.91:105-113 '60.

(MIRA 15:12)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR.
(Alkalies)
(Nitrocellulose)

NIKITIN, Nikolay Ignat'yevich. Prinimali uchastiye: ABRAMOVA, Ye.A., starshiy nauchnyy sotr., kand. khim. nauk; AKIM, E.L., inzh.-tekhnolog; ANTONOVSKIY, S.D., dots., kand. tekhn. nauk; VASIL'YEVA, G.G., inzh.-tekhnolog; ZAYTSEVA, A.F., starshiy nauchnyy sotr., kand. tekhn.nauk; KLENKOVA, N.I., kand. tekhn. nauk; MALEVSKAYA, S.S., kand. khim. nauk; NIKITIN, V.N. starshiy nauchnyy sotr., kand. fiz.-mat. nauk; OBOLENSKAYA, A.V., kand. tekhn. nauk, dotsent; PETROPVLOVSKIY, G.A., starshiy nauchnyy sotr., kand. tekhn. nauk; PONOMAREV, A.N., kand. tekhn. nauk, dots.; SOLECHNIK, N.Ya., prof., doktor tekhn. nauk; TOKAIEV, B.I., inzh.; TSVETAYEVA, I.P., kand. tekhn. nauk; CHOCHIYEVA, M.M., kand. tekhn. nauk; ELIASHBERG, M.G., doktor tekhn. nauk; YUR'YEV, V.I.; KARAPETYAN, G.O., red.izd-va; ZAMARAYEVA, R.A., tekhn. red.

[Wood chemistry and cellulose] Khimiya drevesiny i tselliulozy. Moskva, Izd-vo Akad.nauk SSSR, 1962. 711 p. (MIRA 15:2)

1. Chlen-korrespondent Akademii nauk SSSR (for Nikitin). 2. Zaveduyushchiy kafedroy fizicheskoy i kolloidnoy khimii Lesotekhnicheskoy akademii (for Yur'yev).

(Cellulose)

NIKITIN, N.I.; PETROPAVLOVSKIY, G.A., kand.tekhn.nauk

Low-substituted cellulose esters and prospects for their uses.
Khim.nauka i prom. 4 no.6:713-718 '59. (MIRA 13:8)

1. Chlen-korrespondent akademii nauk SSSR (for Nikitin).
(Cellulose esters)

1975

SCIENCE

AUTHORS: Nigmatov, N. I. (Nepribornyye i ordeny i znanii Akademii
 of Sciences USSR), P. M. Ibragimov, G. A. (Candidate
 of Technical Sciences)

TITLE: Low-Temperature Crystallization Effects and the Properties of
 Their Applications

PERIODICAL: Kriyofizika i inzhenernaya fizika, 1975, No. 1,
 Moscow, USSR (USSR)

ABSTRACT: The article deals with the effects of low-temperature
 low temperatures and temperature of the particles
 of the cellulose macromolecules, and with the effects
 of weak crystallization of cellulose. It was shown
 by one of the authors (Z. PKM, 1971, Vol. 5, p. 1022) that
 increased swelling of cellulose is observed at low
 temperatures and subsequent crystallization and swelling
 considerably weakened the intermolecular bonds. Weak
 crystallization with ammonia oxide added stabilizes
 and is found considerably increase of oxidative

Card 1/1

Low Substituted Cellulose Ethers and Their
Properties of Their Acetates

SCIENCE

It was shown (N. I. Vlasov, N. I. Kuznetsov,
 Symposium on "Investigation in the Field of High
 Molecular Weight Compounds" (Sovetskaya Akademiya
 Nauk SSSR, Moscow, 1964, Part 1, p. 100), that
 p. 100; Z. P. K. (1964), Vol. 6, p. 100; it is shown
 Vol. 6, p. 100) that acetylating materials and
 weakly acetylated cellulose ethers in water, and
 particularly in 1-10% NaOH solution, increased
 considerably their hygroscopic properties and
 lowered somewhat the degree of polymerization.
 These changes can be explained by the breaking
 of the system of long macromolecules due to the
 strong swelling of cellulose. Mild treatment of
 pressed alkali cellulose with vapors of ethylene
 oxide or methyl iodide yielded products with in-
 creased hygroscopicity and hydrolyzability. For
 example, a product containing 7-8% $\text{C}_2\text{H}_5\text{OCH}_2\text{CH}_2\text{O}$ -
 groups gave 8% sugars on 6 hr treatment with
 5% H_2SO_4 at 100° C as compared with only 10%

Card 2/2

Low-Substituted Cellulose Fibers and the
Prospects of Their Application

7727
SOV/63-4-1003

sugars, obtained under identical conditions from nonalkylated cotton linters. Evidently, the introduction of the bulky radicals (CH_3 or $-\text{OCH}_2\text{CH}_2\text{CH}_3$) caused the break of the hydrogen bonds between adjacent cellulose molecules and the appearance of new free hydroxy groups susceptible to hydration. This was confirmed spectroscopically by V. N. Nikitin (ZhFKh, 1949, Vol 23, p 775). The packing of macromolecules was also investigated calorimetrically by Kienkova and Nikitin (ZhPKh, 1964, Vol 27, p 171; Ibid., p 493), who established that weak etherification and swelling in NaOH at low temperature changed the chemical as well as the physical structure of the fibers; the above processes increased the hygroscopic properties of the fiber and made possible the obtaining of cellulose solutions which could be utilized for preparing cellulose films and other products. The application of the congealing method to low-etherified

Card 3 6

Low-Substituted Cellulose Ether and the Prospects of Their Application

1967
SO7.03-44-1-27

cellulose xanthate reduced to CS_2 expenditure to 10-12% and even 5-7%, based on the weight of Cl cellulose (DAN SSSR, 1960, Vol. 20, p. 190; Z'PKh, 1940, Vol. 13, p. 230; ibid., 1947, Vol. 20, p. 153). In practical tests, 15% CS_2 was used; the etherified xanthate was dissolved in NaOH, and cooled slowly to congealing point. Staple fibers obtained from this material had a breaking length of 16-18 km, and elongation of 1-1.8%. Further studies on this subject were reported in Dokl. Prosl. 1961, No. 1, p. 18. Low-substituted cellulose xanthate was obtained by the authors (Z'PKh, 1947, Vol. 24, p. 144, 145) on single-stage xanthation with dimethyl sulfate at 15°C. The cellulose thus obtained from better linters had a degree of etherification $\gamma = 0.04$, a high degree of polymerization (1,000,000), and was readily soluble in 1-1.5% NaOH solution which congealed to 10-15°C and then thawed. Concentrated

Card 4/7