

TRUNIN, A.P.; FINAREVSKIY, I.I.; CHISTYAKOV, S.V.; PETUKHOVA, V.A.,
tekhn. red.

[Practical handbook on large scale phototheodolite surveying]
Fototeodolitnaia s"emka v krupnykh masshtabakh; prakticheskoe
rukovodstvo. Leningrad, 1960. 240 p. (MIRA 16:6)

1. Leningrad. Vsesoyuznyy nauchno-issledovatel'skiy markshey-
derskiy institut.
(Photographic surveying) (Theodolites)

TRUNIN, A.I., hand. dokum. znaki: VozR 1, 1.1., 1950

Construction and adjustment of an electronic leveling circuit.
[Trudy]VNIMI no.50:368-381 '65.

(MIRA 17.00)

12

Determination of ammonia in meat. G. Trunin. *Mysl. Zhur.* 1940, No. 1, 23-4; *Khim. Referat. Zhur.* 1940, No. 6, 77-8.—In a specially constructed app. for microchem. detn. of NH_3 in meat, the NH_3 is distd. under reduced pressure, in a slow current of air, and is absorbed in a column contg. beads. The distn. requires 0.5-1.0 hr. Shake the ground meat sample for 1 hr. in a cylinder in a Wagner app., filter, and ppt. the proteins by adding to 150 cc. of the filtrate in a 200-cc. measuring flask 20 cc. of 10% Na_2WO_4 ; shake, add 20 cc. of 1/2 N H_2SO_4 , and place the receiver 5 cc. of 0.1 N H_2SO_4 , and 3.5 cc. of water and place in a glass with water. Add 12-15 cc. of satd. Na_2CO_3 soln. through a funnel to the distg. flask and heat it to 50-60° on a water bath. The distn. is completed when the absorption column is 2/3 filled with the distillate. After distn. titrate the acid in the receiver with 0.5 N NaOH soln., using a mixt. of methyl red and methylene blue as the indicator. The method is as accurate as the Folin method, and requires considerably less time.
W. R. Henn

METALLURGICAL LITERATURE CLASSIFICATION

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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157 AND 158 ORDERS PROCESSES AND PROPERTIES INDEX

140 AND 141 CAPS

12

CA

Rapid determination of fat. G. N. Trunin. *Voprosy Pisheniya* 10, No. 2-4, 71-6(1941).—On treatment with HCl the liquefied material is extd. with Et₂O while heated and stirred electrically in a special app. (cf. Shirokov, *Mjansnye Industriya* 1936, No. 3). The Et₂O layer is removed by the gravity of water, flowing from an elevated vessel and entering the extn. flask near the bottom. This procedure is sufficiently accurate for detg. fat in meat products, and can be completed in 3 hrs. Another satisfactory way is to ext. the fat while heating, but without stirring, and to sep. the fat soln. from the acidic soln. in a sepg. funnel. Then the acidic soln. is washed once with Et₂O in a specially designed sepg. column. Both methods are suitable for use in the meat-packing industry. Data grams of app. are given. T. Laanes

ASB-ILA METALLURGICAL LITERATURE CLASSIFICATION

157 AND 158 ORDERS

140 AND 141 CAPS

12

TRUNIN, I.I., inzhener.

Calculation of turbine disks for creep by the method of elastic
solutions. [Trudy] TSNIITMASH 71:104-121 '55. (MLBA 9:8)
(Creep of metals) (Disks, Rotating)

SOV/137-57-11-22337

Translation from: Referativnyy zhurnal, Metallurgiya, 1957, Nr 11, p 242 (USSR)

AUTHORS: Mirkin, I.L., Trunin, I.I.

TITLE: An Investigation Into Creep and the Destruction of Steel in the Zone of Stress Concentration (Issledovaniye polzuchesti i razrusheniya stali v zone kontsentratsii napryazheniy)

PERIODICAL: V sb.: Prochnost' metallov. Moscow, AN SSSR, 1956, pp 117-132

ABSTRACT: An analysis is provided of the stressed and deformed states of metal and of the process of failure in the creep testing of cylindrical specimens (S) of various degrees of rigidity with annular notches (N). Steels EI-10 and EI-257 are the objects of investigation. Two identical annular N, 40 mm apart, are made on each S to eliminate the mutual influence of unevenly stressed states arising in cross sections of these N. Rigidity is estimated by the stress concentration at the apex of the N and the degree to which the stressed state becomes three-dimensional to a point at which this is a real factor. An approximate estimate of the value of the plastic deformation (D) in each portion of the cross section is made in terms of the

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SOV/137-57-11-22337

An Investigation Into Creep and the Destruction of Steel (cont.)

increase in microhardness relative to its value at the center of the smallest cross section of the S. It is found that at various degrees of stress concentration, various durations and temperatures of testing, a pronounced unevenness in distribution of stresses and of plastic D in the metal beneath the N remains, as does the three-dimensional nature of the stressed state observed during standard tensile testing of notch S at room temperature. Maximum plastic deformation occurs in the layers of metal close to the surface at the bottom of the N. D drops rapidly with distance from the N and radially toward the deeper layers of metal in the direction of the center of the smallest cross section of the S, and a boundary is found between the region of large plastic and small elastic-plastic D. In this zone, at a depth of 0.2-0.4 mm from the bottom of the N, primary loci of failure are found and normal axial stresses attain a peak. Failure always arises and begins to spread from the grain boundaries and is of the nature of cleavage of crystal particles away from each other along their boundaries.

L.G.

Card 2/2

MIRKIN, I.L., professor, doktor; TRUNIN, I.I., inzhener.

"Methods for hot mechanical testing of metals", A.M. Borzdyka.
Reviewed by I.L. Mirkin, I.I. Trunin. Zav. lab. 22 no. 2: 253-255
F '56. (MLRA 9:6)
(Metals--Testing) (Borzdyka, Anatolii Matveevich)

TRUNIN, I.I.

124-11-13571

Translation from: Referativnyy Zhurnal, Mekhanika, 1957, Nr 11, p 173 (USSR)

AUTHORS: Mirkin, I. L., and Trunin, I. I.

TITLE: Investigation of the Creep and Failure of Steel in the Stress-Concentration Zone (Issledovaniye polzyuchesti i razrusheniya stali v zone kontsentratsii napryazheniy)

PERIODICAL: V sb.: Ispytaniya i svoystva zharoprochn. materialov, Moscow, Mashgiz, 1957, pp 25-45

ABSTRACT: The paper describes tests on the creep and continued strength of cylindrical samples with circular notches made of heat-treated steel EI257 or EI10 throughout a temperature range of 550° to 650° C. Having determined the increment of micro-hardness at various points of a longitudinal grind, the Authors have found, with approximation, the zone of maximal plastic deformation. The failure process was analyzed with the aid of microscopic structural analysis of strata-wise grinds. A number of properties established at room temperature remained unchanged under test conditions, namely: a pronounced non-uniformity of the stress distribution and plastic deformation of the

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124-11-13571

Investigation of the Creep and Failure of Steel in the Stress-Concentration Zone
(Continued)

metal underneath the notch; a deformation peak within the near-surface layers of the metal directly below the furrow of the notch. The deformation rate drops steeply from the surface layer to the center of the sample. Inception of failure occurs at a depth of 0.2 to 0.4 mm. from the bottom of the notch. The peak of axial stresses lies near the bottom of the notch and close to the location of incipient failure. It is deduced therefrom that the normal stress is the determining stress during failure. Through relaxation the peak stresses diminish somewhat with the passing of time. Failure always occurred along the grain perimeter.

Bibliography: 8 references.

(V. S. Namestnikov)

Card 2/2

Trunin, I.I.
USSR/Solid State Physics - Mechanical Properties of Crystals
and Poly-Crystalline Compounds

E-9

Abs Jour : Ref Zhur - Fizika, No 1, 1958, 1111

Author : Mirkin, I.L., Trunin, I.I.
[Central]

Inst : General Scientific Research Institute for Technology and
Machine Building

Title : Investigation of the Failure Zone in Creep

Orig Pub : Metallovedeniye i obrabotka metallov, 1957, No 6, 2-7

Abstract : It was established experimentally that there is a reduction in the microhardness of the metal near the cracks that occur during creep. This is explained by the crumbling of the material, due to accumulation of vacant sites of the crystalline lattice in places that are located near the visible damage centers. In an investigation of the E110 steel, the reduction in the hardness, due to

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USSR/Solid State Physics - Mechanical Properties of Crystals
and Poly-Crystalline Compounds

E-9

Abs Jour : Ref Zhur - Fizika, No 1, 1958, 1111

crumbling, is observed in a band approximately 100 micron wide. The greatest reduction in the microhardness (the maximum crumbling) reaches 12 -- 14%.

Card 2/2

MIRKIN, I.L.; TRUNIN, I.I.

Statistical method for investigating the destruction zone of metals
by measuring microhardness. Zav.lab. 23 no.2:229-235 '57.
(MIRA 10:3)

1. Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i
mashinostroyeniya.
(Metals--Testing)

TRUMIN, I. I. Cand Tech Sci -- (diss) "Study of the process of disintegration
of steel ^{during} in creepage." ~~Central~~ ^{Inst of Heavy Machine Building} Mos, 1958. 18 pp (Glavniiprojekt under Gosplan USSR.
Central Sci Res Inst of Technology and Machine building TSNITMash), 150 copies
(KL, 36-58, 113)

AUTHORS: Gel'man, A. S., Griboyedova, T. S., Ye. A. Davidovskaya, Lazarev, B. I., Lyubavskiy, K. V., Slepak, E. S., Trunin, I. I. and Fedortsov-Lutikov, G. P.

TITLE: Investigation of the Steel IX1uH12T as Tube Material for Power-generation Equipment (Issledovaniye stali IX18N12T v kachestve trubnogo materiala dlya energoustanovok)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, No. 3, pp. 16 - 24 (USSR)

ABSTRACT: For producing tubes operating at super-critical steam parameters, it is necessary to have available a cheap, strong and ductile material which has a stable structure and stable properties at 550 to 650 °C, is not inclined to develop inter-crystallite corrosion and possesses good technological properties. The work carried out in 1952 and 1953 by TsNIITMASH jointly with the imeni Ordzhonikidze Works (Ref.1) proved that it was possible to utilize cheap steel of the type IX18H9T for operation at high temperatures. Later, complex investigations were carried out with this steel as a material for tubes of super-critical parameter power-generation equipment. The steel IX18H9T may contain large quantities of ferrite and, after long duration annealing at 600 to 700 °C, it embrittles due to the formation of a σ -phase. Increase in the nickel content

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generation Equipment

to 11-13% brought about an appreciable increase in the stability of the austenite without affecting the high strength. This steel, designated as 1X18H12T steel, does not show any α - or σ -phase separation during ageing at 700 °C for 10 000 hours and at 750 °C for 3 000 hours; only slight quantities of carbides were found to separate out. Thereby, the impact strength is maintained at 22-24 kg/cm² for this steel, whilst in the case of the steel 1X18H9T, it drops to 9-18 kg/cm². The investigations described in this paper were carried out on commercial tubes, rods and also on laboratory produced steels with compositions as given in Table 1, p. 16. The results are entered in tables and plotted in graphs. It is concluded that the steel 1X18H12T, containing 0.08-0.2% C, max. 75% Si, 1-2% Mn, 17-18.5% Cr, 11-13% Ni, max. 0.20% S and max. 0.035% P, is suitable for operation at high temperatures; the Ti content of the steel is thereby determined by means of the formula $5(C-0.02)$. The best combination of mechanical properties was obtained after annealing at 1 050 to 1 100 °C for 30 min. and cooling in air, and this regime is recommended for tubes as well as for bends. Welded joints should be annealed at 1 000 to 1 050 °C for 1 hour and then cooled in air. The mechanical properties of steels

Card 2/4

. Investigation of the Steel 1X18H12T as Tube Material for Power-generation Equipment

heat-treated in accordance with these recommendations are entered in Table 6, p. 24, for test temperatures of 20, 600, 650 and 700 °C. Practically no embrittlement takes place for this steel after ageing at 600 and 750 °C for durations of 3 000 to 10 000 hours; no σ -phase formation could be detected after such ageing for steel containing 12% Ni, whilst under similar conditions, σ -phase formation can occur in steel containing 10 % Ni. Preliminary, non-uniform work-hardening influences the ultimate strength of the steel, but does not influence appreciably the ductility in the case of long-duration loading. In the case of contact-welding of tubes of superheaters, the strength of non-heat-treated weld joints is not lower than that of the base metal. Steam at 600 °C and long-duration tests for up to 3 000 hours do not affect appreciably the long-duration strength of the steel and of welded joints. The steels 1X18H12T and 1X18H9T are less inclined to develop thermal fatigue than the steel 1X14H14B2M, and the authors recommend using the steel 1X18H12T for tubes of power-generating equipment, operating with steam of super-critical parameters. There are 5 figures, 6 tables and 8 references, 5 of which are Russian, and 3 English.

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Investigation of the Steel 1X18H12T as Tube Material for Power-generation Equipment

ASSOCIATION: TsMIITMASH

AVAILABLE: Library of Congress

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SOV/129-58-11-4/13

AUTHORS: Trunin, I. I., Engineer, and Mirkin, I.L, Doctor of Technical Sciences, Professor.

TITLE: Investigation of the Creep Failure of Steel
(Issledovaniye razrusheniya stali pri polzuchesti)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, Nr 11,
pp 25-32 (USSR)

ABSTRACT: The authors studied the failure in the stress concentration zone for three-dimensional tensile forces under creep conditions. In earlier work (Ref 1) the method of static micro-hardness measurements on cuts prepared from the failure zone of notched specimens after long duration strength tests was applied, a method described in another paper of the authors (Ref 2). On the basis of investigating the pearlitic steel EI10 it was shown that the formation of micro and macro-cracks is preceded by a loosening of the metal which is evidenced by a reduced resistance to squeezing inside a radius of 100 μ around the visible failure spot. For verifying earlier obtained results, the authors investigated smooth specimens of the steel EI10 and notched specimens of the steels EI257 and 1Kh18N12T. For ferromagnetic materials, the magneto-

Card 1/3 metallographic analysis was also used. The measured

Investigation of the Creep Failure of Steel SOV/129-58-11-4/13

micro-hardness values in the zone of influence of the entire notch are entered in Table 1. For elucidating the nature of settling of magnetic particles around visible failure spots, a cut with a visible crack and only small failure foci was magnetised; the magnetic particles settled intensively along the crack and filled up the entire surface of the failure area, see Fig.1. The magneto-metallographic investigations also enabled establishing the existence of a loosening of the material which precedes the formation of visible failure spots. If the defects in the loosened zone are such that heating can heal them, an appropriate heat treatment should bring about an increase of the relative resistance to squeezing and local disturbances of the magnetic field should cease. To verify this assumption experiments were carried out, the results of which are entered in Table 2; heating to 650°C brings about an increase in the micro-hardness of the metal near to the edge of the crack, whilst the resistance to pressing in of the "healthy" metal remains almost unchanged. On the basis of the results obtained by the authors of this paper and comparison of these with

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Investigation of the Creep Failure of Steel SOV/129-58-11-4/13

results of experimental and theoretical work of other authors, the following conclusions are arrived at: long duration failure at elevated temperatures is preceded by the formation of a loosened zone with an increased concentration of accumulations of vacancies in the crystal lattice; this process leads to a weakening of the interatomic bond forces in the highest stressed volumes of the metal which brings about favourable conditions for forming nuclei of micro and macro-cracks. There are 4 figures, 2 tables and 14 references, 11 of which are Soviet, 3 English.

ASSOCIATION: TsNIITMASH

1. Steel--Creep
2. Steel--Failure properties
3. Steel--Mechanical
4. Steel--Test results

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10(5) PAGE 1 BOOK EXPLORATION 809/2103

Teoreticheskiy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya
Struktura i svoystva shirokopolosnykh materialov [zhurnal] (Structure and Prop-
erties of Heat-Resisting Materials), Collection of Articles Moscow, Nauka, 1979.
(Series: Issl (Trudy) kn. 93) Strips ally inserted. 4,000 copies printed.

Additional Sponsoring Agencies: USSR. Gosudarstvennaya planovaya komissiya and
Glavnye upravleniya nauchno-issledovatel'skikh i proyektnykh organizatsiy.
Ed.: E. B. Petrovskiy, Candidate of Technical Sciences Ed. of Publishing
House: I. A. Ivanov; Tech. Ed.: A. P. Orlov; Managing Ed. for literature on
Metal Working and Tool Making: R. B. Byral'man.

PURPOSE: This book is intended for workers of scientific research institutes and
for engineering staff of plant laboratories of the boiler and turbine
industries and power stations. It may also be useful to staff members of
higher educational institutions studying problems of physical metallurgy.

CONTENTS: This collection of articles describes results of work done at
KAZAN' on the strength of steels used constantly at high temperatures
in power plants. The articles deal with problems of heat resistance, al-
loying, and the production and heat treatment of heat-resistant steels.
The evaluation of properties of industrial materials used under high and
ultra-high pressures is given, and modern testing methods are discussed. Be-
havioralities are mentioned. References follow several of the articles.

INDEX OF CONTENTS:

Travis, I. I. (Candidate of Technical Sciences). Effect of Preliminary Deforma-
tion on Behavior of Materials During Subsequent Operations at High
Temperatures 99

The influence of strain hardening by tension and torsion
on the strength and ductility of heat-resistant steels is dis-
cussed. The effect of strain hardening on creep resistance,
recrystallization, and stability of mechanical properties, and
phase composition at aging is presented.

SECTION III. MATERIALS FOR HIGH AND ULTRA-HIGH PRESSURE UNITS

Podsterny-Latkov, O. P. (Candidate of Technical Sciences), and T. S.
Golovinskaya (Engineer). Investigation of 18Kh12T and 18Kh20 steel for
boilers of boiler units 120

An investigation of physical, mechanical, and heat-resisting
properties of Cr-Mn austenitic steels is described. The phenomena
of thermal fatigue and aging of these steels are discussed.

Podsterny-Latkov, O. P., and N. P. Shabanov (Engineer). Investiga-
tion of the Properties of 18Kh17 Chrome Steel 100

An investigation of mechanical properties, creep strength and
creep rate at temperatures up to 600°C is presented.

Podsterny, S. A., and M. D. Belyakov. Change in Phase Composition of
18Kh17 and 18Kh17T Steels in Heat-Treating Conditions 117

The steels under investigation were investigated at 1150°C
with subsequent aging at 600-650°C for up to 5,000 hours.
The change in phase composition was studied by means of structural
x-ray analysis and compared with results of chemical analysis and
metallographic investigation.

For 1,500 to 2,000 hours, are presented.

Podsterny, S. A., V. A. Belikov (Engineer). Electronographic Investiga-
tion of the Structure of Oxide Films on 18Kh12 and 18Kh17 Steels and a Group
of Fe-Cr-Ni-Al Steels Alloys 261

The structure of oxide films generated under various temperatures
and holding times is discussed. The influence of preliminary heat
treatment (investigations made after quenching and tempering) is
noted.

AVAILABLE: Library of Congress

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TRUNIN, I.I., inzh.

Effect of preliminary deformation on heat resistance. [Trudy]
TSNIITMASH 100:42-58 '59. (MIRA 13:7)
(Deformations(Mechanics))
(Heat-resistant alloys)

S/137/61/000/010/031/056
A006/A101AUTHOR: Trunin, I.I.

TITLE: The effect of cold hardening conditions on the durability of steel

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no.10, 1961, 53, abstract
10Zh338 (V. sb. "Metallovedeniye i term. obrabotka metallov" [Tr.
Sektzii metalloved. i term. obrabotki metallov. Tsentr. pravl.
Nauchno-tekhn. o-va mashinostroik., prom-sti, no. 2], Moscow, 1960,
12 - 17)

TEXT: The author studied the effect of preliminary deformation by tension, torsion or bending on the durability of cylindrical 1X18H12T (1Kh18N12T) steel specimens at 610°C. It is noted that cold hardening resulting from tension increases durability by 10%. Cold hardening by non-uniform tension raises durability by about 20%; cold hardening by torsion by 30% causes a reduction of reference durability limits by about 20%. Cold hardening by torsion and bending by 15% does not affect noticeably changes in durability at 1,000 - 1,500 hours testing time. The effect of cold hardening on heat resistance of the steel is explained by two factors: 1) mechanical strengthening during cold hardening, connected

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The effect of cold hardening conditions ...

S/137/61/000/010/031/056
A005/A101

with distortions of the crystal lattice which causes higher durability; 2) activation of diffusion processes, which is connected with an increase in the gradient of stress in the metal and entails the lowering of reference limits of durability.

P. Zubarev

[Abstracter's note: Complete translation]

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S/032/61/027/001/017/037
B017/B054

AUTHORS: Trunin, I. I., Tseytlin, V. Z., and Zeytman, G. I.

TITLE: Effect of Interruptions on Stress-rupture Tests

PERIODICAL: Zavodskaya laboratoriya, 1961, Vol. 27, No. 1, pp. 66-71

TEXT: The authors tested the effect of periodic interruptions on stress-rupture tests of the following steels and alloys: IX18H9T (IKh18N9T), ЭИ723 (EI 723) (0.22-0.33% C, 2.1-2.5% Cr, 0.90 - 1.10% Mo, 0.3-0.5% V), ЭИ765 (EI 765) (0.09% C, 14.5% Cr, 1.3% Ti, 5.2% W, 4.2% Mo, 1.94% Al, 0.08% B, balance Ni), and nickel-chromium alloys in a highly plastic state. Interruption of the stress-rupture endurance test during which the specimen was cooled to room temperature, and then held at this temperature for 24 hrs, had little effect on the course of the curves. A significant effect, however, was produced on specimens that had not been cooled before. IX18H9T (IKh 18N9T) and ЭИ765 (EI 765) steel specimens were destroyed at the grain boundaries. Most of the materials which had been cooled previously withstood up to 14 interruptions. Only EI 723, which possesses a very high ductility in continuous tests (average reduction of area of 55.8%), showed

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Effect of Interruptions on
Stress-rupture Tests

S/032/61/027/001/017/037
B017/B054

lower ductility in interrupted tests. A considerable effect of interruptions on rupture life can be expected in cases where total elongation in continuous tests does not exceed 1%, and when sudden shocklike load removal occurs. Engineer T. A. Bugrov and Senior Technician M. F. Lesnykh (TSNIITMASH - Central Scientific Research Institute of Technology and Machine Building) assisted in the tests. There are 6 figures, 1 table, and 4 references: 3 Soviet and 1 German. ✓

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya (Central Scientific Research Institute of Technology and Machine Building), Taganrogskiy zavod "Krasnyy kotel'shchik" (Taganrog "Krasnyy kotel'shchik" Plant)

Card 2/2

S/207/62/000/005/010/012
B125/B102

AUTHOR: Trunin, I. I. (Moscow)
TITLE: Creep of heat-resistant steel under a complex state of stress
PERIODICAL: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 5,
1962, 159-162

TEXT: The regularities of creep for complex states of stress where the increase in deformation is constant are studied. Sufficiently reliable values of the constant creep rate were sought for each stress. Most of the tests lasted 2000 hrs. Their results are given in Table 1. The stress intensity σ_i is taken as a measure of the state of stress. Creep is more intense in tension than in torsion. An additional twisting moment slightly reduces the axial rate V of creep in the case of axial normal stress. Under torsion an additional tensile force raises angular velocity of creep. Determining the intensity of plastic deformation intensity affords only a qualitative picture of the process. The creep criterion $V_i = A\sigma_i^n(\tau_{\max})^m$ (1) is in good agreement with the experimental results.

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Creep of heat-resistant steel ...

S/207/62/000/005/010/012
B125/B102

E.g., this criterion gives the correct rate of creep for 1X18H9T (1Kh18N9T) steel. Despite the lack of sufficient experimental data this criterion is suitable for many substances. Yu. N. Rabotnov and V. S. Nemestnikov are thanked for advice.

SUBMITTED: February 5, 1962

Table 1. 15X1M1Φ (15Kh1M1F) steel. Results of test for creep $t = 570^{\circ}\text{C}$, $n = 13,0353$, $m = -11.4440$, $\log A = -8.8898$, stresses in kg/mm^2 , rates in % per hour, values V_{i1} - from measurements, V_{i2} - from the formula (1).

σ_x	τ_{xy}	$V_x \cdot 10^4$	$\omega_{xy} \cdot 10^4$	σ_t	τ_{\max}	$V_{i1} \cdot 10^4$	$V_{i2} \cdot 10^4$	σ_x	τ_{xy}	$V_x \cdot 10^4$	$\omega_{xy} \cdot 10^4$	σ_t	τ_{\max}	$V_{i1} \cdot 10^4$	$V_{i2} \cdot 10^4$
12	—	19	—	12	6.0	19	19	—	2	—	0.8	3.5	2	0.5	0.51
10	—	15	—	10	5.0	15	14	14	7	18	18.5	9.9	19	17	17
6	—	5.6	—	6	3.0	5.6	6.2	8	4	5.0	3.6	10.4	5.6	6.0	7.0
5	—	4.5	—	5	2.5	4.5	4.7	5	2.5	3.5	2.0	6.6	3.5	3.7	3.4
—	6	—	5.0	10.4	6	2.9	2.9	5	2.5	3.5	2.4	6.6	3.5	3.8	3.4
—	3.5	—	2.0	6.0	3.5	1.2	1.2	4.5	2.25	3.0	3.5	5.0	3.2	3.8	2.8
—	3	—	1.5	5.2	3	0.9	0.96	4	2	1.5	1.4	5.2	2.8	1.7	2.3
—	2.5	—	1.2	4.3	2.5	0.7	7.04								

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S/590/62/105/000/004/015
I031/I242

AUTHORS: Trunin, I.I., Candidate of Technical Sciences,
and Shaban, G.A., Technician

TITLE: Tensile strength of heat-resistant steels under
complex stress conditions

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy
institut tekhnologii i mashinostroyeniya. Trudy,
v.105, 1962, 42-56

TEXT: There is no reliable method for designing power plants
for service at elevated temperatures. Tensile
strength of steam superheater pipes made of perlitic steel 15 X 1M1Q
(15 Kh 1M1F) and austenitic steel 1X18H12T(1 kh18N12T) was investi-

1/3

S/590/62/105/000/004/015
I031/I242

Tensile strength of heat-resistant...

gated under combined tensile and torsional loads. Three sets of specimens were cut from pipes and heat-treated. Each set was tested under different stress conditions: simple tension, simple torsion and a combination of the two. During the rupture test, longitudinal and angular deformation were determined and plotted against time of rupture. The stresses were plotted against time of rupture on a log-log scale. Metallographic inspection revealed intergranular types of fracture, regardless of the kind of stress. If complex stresses are expressed by the half-sum of the total stress plus the greatest principal stress, the creep behavior in combined loading may be determined by a unidirectional tensile test. This conclusion is based on test results which follow the equation:

Card 2/3

S/590/62/105/000/004/015

I031/I242

Tensile strength of heat-resistant... $\theta_k = A \left(\frac{\sigma_1 + \sigma_2}{2} \right)^{-m}$

where: θ_k = time to rupture; σ_1 = greatest principal stress;

σ_2 = total stress. [Abstracter's note: A and m not defined].

Propagation of fracture under creep conditions in complex state of stresses is faster than under a unidirectional tension load.

There are 7 figures and 5 tables.

Card 3/3

S/590/62/105/000/011/015
I031/I242

AUTHORS: Trunin, I.I., Candidate of Technical Sciences
and Shaban, G.A., Technician

TITLE: Effect of preliminary deformation on the heat-
resistance of pipe steel

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy
institut tekhnologii i mashinostroyeniya. Trudy.
v.105, 1962, 144-164

TEXT: The effect of cold work on creep is determined by
the mechanical strengthening resulting from cold plastic deforma-
tion and the residual stresses induced during preliminary deforma-
tion. This investigation was intended to evaluate the effect

Card 1/2

S/590/62/105/000/011/015
I031/I242

Effect of preliminary deformation...

of non-uniform cold plastic deformation on the creep resistance of perlitic steel 15x 1M 10 (15Kh 1M 1F) and austenitic steels: ЭИ 694 (EI 694), ЭИ 695 (EI 695), and ЭП 17 (EP17) used in pipe manufacture. The experiments were carried out with untreated specimens; specimens deformed by 15% twisting; specimens deformed by 50% twisting; followed by heat-aging for 3000 hrs at 610°C (EI 694) or 660°C (EI 695). As a result of preliminary deformation both austenitic and perlitic steels became brittle under long-term stresses. Deformation of 10% and above, at 20°C, had detrimental effect on heat-resistant properties of both steels. In order to recover the initial properties, heat treatment of the parts subjected to cold deformation is recommended. There are 5 figures and 6 tables.

Card 2/2

S/207/63/000/001/014/028
E200/E441

AUTHOR: Trunin, I.I. (Moscow)

TITLE: Estimation of creep rupture and some characteristics
of deformations under complex stress systemPERIODICAL: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki,
no.1, 1963, 110-114

TEXT: The author aims at developing a method which would predict creep for complex stress systems from behavior under uniaxial stress. It is found from tests on tubular specimens that log applied stress σ_1 / log period to fracture curves differ from log first principal stress σ_1 / log period to fracture curves for tensile, torsional and combined loadings. Log $[(\sigma_1 + \sigma_2)/2]$ / log period to fracture curves for those three loadings compare well and allow one to determine creep rupture under tensile-torsional loading from tensile load rupture curves with inaccuracy not greater than 30%. The author confined himself to tests on two steels: pearlite (C = 0.09%, Cr = 1.1%, Mo = 0.9%, V = 0.2%) at 570°C and austenite (C = 0.12%, Cr = 17.5%, Ni = 12%, Ti = 0.7%) at 610°C. The author concludes that time to creep rupture can be obtained from

Card 1/2

Estimation of creep rupture ...

S/207/63/000/001/014/028
E200/E441

$$t_{\text{hours}} = A \left(\frac{\sigma_1 + \sigma_2}{2} \right)^\eta$$

where A and η - constants obtained from uniaxial stress experiments for a given material. He also states that extrapolation is permissible only for intercrystalline fracture. There are 3 figures and 1 table.

SUBMITTED: August 5, 1962

Card 2/2

TRUMAN, I.I.

Evaluation of stress-rupture strength of materials by
parametric methods. Zav.lab. 29 no.3:344-352 '63.
(MIRA 16:2)
(Strength of materials) (Refractory materials)

S/032/63/029/003/015/020
B101/B186

AUTHOR: Trunin, I. I.

TITLE: A method for determining the plasticity of heat resistant materials under creep conditions

PERIODICAL: Zavodskaya laboratoriya, v. 29, no. 3, 1963, 357-363

TEXT: To achieve greater accuracy in estimating deformations in the single creep periods it is suggested to adopt for the primary curves the relation log time versus log relative deformation. This represents the single creep periods by straight lines, so that comparison with the curves log time versus log relative deformation makes it possible to determine the end of the first creep period, the beginning of the intensive destruction and the end of the section with minimum creep rate. Experiments with chromium-nickel-austenitic steel proved a linear relation for all three creep periods in the system log time versus log stress. Similar relations are also valid for log stress versus log deformation rate. It is shown that experimental data offer a basis for finding a desired limit of the long-life strength and of the stress where no

Card 1/2

S/032/63/029/003/015/020
B101/B186

A method for determining the ...

intensive destruction sets in for a chosen life-time. It is pointed out that the method is subject to the same errors as all extrapolation methods. Sometimes deviations from linearity occur, which diminish the reliability of the calculations of the long-life strength. It is recommended, therefore, to collect experimental data by the suggested method and to test their applicability to different materials. There are 3 figures and 2 tables.

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

Card 2/2

"APPROVED FOR RELEASE: 03/14/2001

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APPROVED FOR RELEASE: 03/14/2001

CIA-RDP86-00513R001756820008-4"

TRUNIN, I.I. (Mskva)

Criteria of strength in case of a complex stressed state under
creep conditions. Prikl.mekh. 1 no.7:77-83 '65.

(MIRA 18:8)

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

ТРАНИН, И.И., канд. техн. наук

Determination of the work capacity of refractory materials of
steam-power units according to their plasticity during pro-
jected rupture. Teploenergetika 12 no.2:52-63 F '65.

(MIRA 18:3)

I. I. Tranin, Mashino-issledovatel'skiy institut tekhnologii
i mashinostroyeniya.

Card 1/2

"APPROVED FOR RELEASE: 03/14/2001

CIA-RDP86-00513R001756820008-4

APPROVED FOR RELEASE: 03/14/2001

CIA-RDP86-00513R001756820008-4"

TRONIN, I.I., kand. tekhn. nauk

Possibility of restoring the initial heat-resistance characteristics of materials by intermediate thermal treatment. Teploenergetika 11 no.12:5-8 D '64 (MIRA 18:2)

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

TRUNIN, I.I. (Moscow)

" The criterion of strength in creep under combined stresses"

report presented at the 2nd All-Union Congress on Theoretical
and Applied Mechanics, Moscow 29 Jan - 5 Feb 64.

GEMINOV, V.N.; TRUNIN, I.I.; TARKHANOV, G.V.; BORZDYKA, A.M.; AYVAZYAN, S.A.

Discussion concerning the interpretation of the results of testing
of the stress-rupture strength of a metal of several smeltings.
Zav.lab. 29 no.7:827-837 '63. (MIRA 16:8)

1. Institut metallurgii im. A.A.Baykova (for Geminov). 2. Tsentral'nyy
nauchno-issledovatel'skiy i proyektnyy institut tekhnologii i
mashinostroyeniya (for Trunin, Tarkhanov). 3. Tsentral'nyy
nauchno-issledovatel'skiy institut chernoy metallurgii im.
I.P.Bardina (for Borzdyka). 4. Matematicheskiy institut im.
V.A.Steklova AN SSSR (for Ayvazyan).
(Metals—Testing)

GEMINOV, V.N.; TRUNIN, I.I.; TARKHANOV, G.V.; BORZDYKA, A.M.; AYVAZYAN, S.A.

Discussion concerning the interpretation of the results of testing
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1. Institut metallurgii im. A.A.Baykova (for Geminov). 2. Tsentral'nyy
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nauchno-issledovatel'skiy institut chernoy metallurgii im.
I.P.Bardina (for Borzdyka). 4. Matematicheskiy institut im.
V.A.Steklova AN SSSR (for Ayvazyan).
(Metals--Testing)

TRUNIN, L.P.,
S. A. MIKULIN, Liteinoe Delo 10, No. 4, 37-9 (1939)

EXCERPTA MEDICA Sec.9 Vol.12/5 Surgery May 1958

TRUNIN, M.A.

2804. AN ELECTROCARDIOGRAPHIC ASSESSMENT OF THE DYNAMICS OF
CARDIOVASCULAR CIRCULATION IN PATIENTS DURING SURGERY
(Russian text) - Trunin M. A. - VESTN. KHIR. 1957, 78/6 (46-53)

Ninety-two patients were observed. Of this number 62 forming the first group had gallbladder and bile duct disturbances (30 cases) and gastric disorders (32 cases), the 2nd group (30 cases) consisting of patients with thyroid pathology. All these patients were operated upon. Serial ECG revealed that the greatest changes occurred in the T wave and S-T interval, the other elements of the ECG being less affected. The response of the cardiac muscle to different surgical procedures are reflected by the readings, the manipulations on the duodenum, stomach and gallbladder being the most traumatic. During the intervention on the thyroid itself acute pathological deviations occurred in cases of toxic goitre. To palliate possible complications of the cardiovascular system preventive measures - increasing amount of oxygen in the ether-oxygen mixture, blood transfusion, administration of glucose solution and mixture of Seltsovski - are advocated.

KOPOSOV, Ye.S.; TRUNIN, M.A.; PECHENKIN, A.L.

Plastic materials in surgical clinical practice. Trudy LSGMI 59:
43-47 '60. (MIRA 14:9)

1. Gospital'naya khirurgicheskaya klinika Leningradskogo sanitarno-
gigiyenicheskogo meditsinskogo instituta (zav. klinikoy - prof. A.V.
Smirnov) i Leningradskiy nauchno-issledovatel'skiy institut polimeri-
zatsionnykh plastmass (dir. instituta - N.M.Yegorov).
(PLASTICS) (SURGERY, PLASTIC)

TRUNIN, M.A., kand.med.nauk

Some data on polyvinylpyrrolidone, a synthetic highly molecular
compound. Trudy LSGMI 59:39-42 '60. (MIRA 14:9)

1. Gospital'naya khirurgicheskaya klinika Leningradskogo sanitarno-
gigiyenicheskogo meditsinskogo instituta (zav. klinikoy - prof.
A.V.Smirnova).

(PYRROLIDINONE)

NIKITIN, G.D., dotsent; TRUNIN, M.A., kand.med.nauk

Reimplantation and primary dermatoplasty in extensive skin avulsions
of the leg and hip. Trudy LSGMI 59:59-63 '60. (MIRA 14:9)

1. Gospital'naya khirurgicheskaya klinika Leningradskogo sanitarno-
gigiyenicheskogo meditsinskogo instituta (zav. klinikoy - prof.
A.V.Smirnov).
(EXTREMITIES, LOWER--WOUNDS AND INJURIES) (SKIN GRAFTING)

TRUNIN, M. A., kand. med. nauk

Hemodynamic changes in renal and ureteral diseases in connection
with surgical treatment. Urologia no.6:14-20 '61.
(MIRA 15:4)

1. Iz khirurgicheskoy kliniki (zav. - zasluzhennyy deyatel'
nauki prof. A. V. Smirnov) Leningradskogo sanitarno-gigiyenicheskogo
meditsinskogo instituta.

(KIDNEYS—DISEASES) (BLOOD—CIRCULATION)
(URETERS—DISEASES)

TRUNIN, M.A.; DAVIDENKOVA, V.V.

Prolonged peridural anesthesia with the use of polyvinyl
pyrrolidone. Eksper. khir. i anest. 9 no.5:82-84 S-0 '64. (MIRA 18:11)

1. Klinika obshchey khirurgii No.1 (zav. - prof. A.V.
Smirnov) Leningradskogo sanitarno-gigiyenicheskogo medi-
tsinskogo instituta i Leningradskiy institut vysoko-
molekulyarnykh soyedineniy AN SSSR.

KOPOSOV, Ye.S. (Leningrad, Moskovskiy pr. d.50, kv.3); TRUNIN, M.A.;
LESHCHINSKAYA, A.F.

Follow-up and successive treatment of goiter in the polyclinic
and hospital. Vest.khir. no.1:45-52 '62. (MIRA 15:1)

1. Iz gospital'noy khirurgicheskoy kliniki (zav. - prof. A.V.
Smirnov) Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo
instituta i endokrinologicheskogo kabineta polikliniki No.16
(gl. vrach - A.F. Glebushko) g. Leningrada.
(GOITER)

TRUNIN, M.A., kand.med.nauk

Diffuse peritonitis. Trudy LSGMI 59:251-254 '60. (MIRA 14:9)

1. Gosital'naya khirurgicheskaya klinika Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo instituta (zav. klinikoy - prof. A.V.Smirnov).

(PERITONITIS)

TRUNIN, M.A., kand.med.nauk

Modification of the "Rekord" syringe for extensive infiltration
anesthesia. Trudy LSGMI 59:320-321 '60. (MIRA 14:9)

1. Gos'pital'naya khirurgicheskaya klinika Leningradskogo sanitarno-
gigiyenicheskogo meditsinskogo instituta (sav. klinikoy - prof.
A.V.Smirnov). (ANESTHESIOLOGY--APPARATUS AND INSTRUMENTS)

MARTYNCHEV, A.N., kand.med.nauk (Leningrad, Kutuzovskaya nab., d.25, kv.3);
TRUNIN, M.A., kand.med.nauk

Surgery on patients in the middle and advanced age groups. Vest.khir.
83 no.8:57-64 Ag '59. (MIRA 13:1)

1. Iz gosptal'noy khirurgicheskoy kliniki (zav. - prof. A.V. Smirnov)
Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo instituta.
(SURGERY, OPERATIVE in old age)

TRUNIN, M. A.

TRUNIN, M. A.: "Dynamic investigation of the cardiovascular system in surgical patients (using the method of electrocardiography)." Min Health RSFSR. Leningrad Sanitary-Hygiene Medical Inst. Leningrad, 1956. (Dissertation for the Degree of Candidate in Medical Sciences.)

Source: Knizhnaya letopis' No 40 1956 Moscow

TRUMIN, M.A.

Dynamic examination of the cardiovascular system in surgical patients using electrocardiography [with summary in English, p.158]. Vest. khir. 78 no.6:46-53 Jg '57. (MLRA 10:8)

1. Iz gosital'noy khirurgicheskoy kliniki (zav. - prof. A.V.Smirnov) Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo instituta. Adres avtora: Leningrad, bol'nitsa im. Mechnikova, 15-y pavil'on.

(ELECTROCARDIOGRAPHY, in various dis. in preop. care)

(HYPERTENSION, prev. and control control in preop. care)

(PREOPERATIVE CARE
ECG & control of hypertension)

TRUNIN, M.A.

Dynamic electrocardiographic changes during the treatment of obliterating thromboangioneurosis of the lower extremities by intra-arterial blocks. Trudy ISGMI 39:154-162 '58. (MIRA 12:8)

1. Kafedra gosptal'noy khirurgii Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo instituta (zav.kafedroy - z.d.n., prof.A.V.Smirnov).

(THROMBOANGIITIS OBLITERANS, therapy,
glucose-magnesium sulfate-insulin mixture,
intraarterial admin. & eff. on ECG (Rus))

(ELECTROCARDIOGRAPHY,
eff. of glucose-magnesium sulfate-insulin
mixture in ther. of thromboangiitis obliterans
(Rus))

(MAGNESIUM SULFATE, ther. use,
thromboangiitis obliterans, with glucose &
insulin, intraarterial admin. & eff. on ECG (Rus))

(INSULIN, ter use,
thromboangiitis obliterans, with magnesium
sulfate & glucose, intraarterial admin. & eff.
on ECG (Rus))

(GLUCOSE, ther. use,
thromboangiitis obliterans, with magnesium
sulfate & insulin, intraarterial admin. &
eff. on ECG (Rus))

TRUNIN, M.A.

indications for surgical removals of foreign bodies from
intestines. Vest. khir. 77 no.1:117 Ja '56 (MLRA 9:5)

1. Iz gosital'noy khirurgicheskoy kliniki (zaveduyushchiy professor
A.V. Smirnov) Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo
instituta.

(ABDOMEN---SURGERY) (INTESTINES---FOREIGN BODIES)

MARTYNCHEV, Anatoliy Nikolayevich; NIKITINA, Nadezhda Ivanovna;
TRUNIN, Mikhail Aleksandrovich; TAL'MAN, I.M., red.;
SAFRONOVA, I.M., tekhn. red.

[Venous pressure in a surgical clinic] Venoznoe davlenie v
khirurgicheskoi klinike. Pod red. A.N.Martyncheva. Leningrad,
Medgiz, 1963. 123 p. (MIRA 16:5)
(BLOOD PRESSURE) (OPERATIONS, SURGICAL)

KOPOSOV, Ye.S., kand. med. nauk; TRIMIN, M.A., kund. med. nauk

Use of a biological antiseptic tampon in bile duct surgery and
traumatology. Trudy LSCMJ 74:172-176 '62.

(MIRA 17:10)

TRONIN, M.A., dotsent

Perforation in gastroduodenal ulcer. Trudy LSGMI 74:244-256
162. (MIRA 17:10)

SOV/2-58-11-16/18

AUTHOR: Trunin, N.

TITLE: A Regional Meeting of the Chairmen of Cooperative Committees with Regard to the All-Union Census (Krayevoye soveshchaniye predsedateley komissiy sodeystviya Vsesoyuznoy perepisi naseleniya)

PERIODICAL: Vestnik statistiki, 1958, Nr 11, p 87 (USSR)

ABSTRACT: On the 30th of October 1956, a meeting of the chairmen of the cooperative committees took place in Krasnodar; at this meeting the preparations for the forthcoming census were discussed. The Chief of the Regional Board of Statistics, D. A. Kolyako, reported on the present situation, the measures taken in the kray, and on the tasks of the cooperative committees. The second Kraykom Secretary of the KPSS, M.S. Velichkin, stressed the political and economic significance of the census and called upon those present to prepare better the census and to carry it out in an exemplary manner.

Card 1/1

14

PROCESSES AND PROPERTIES INDEX

S

Electric Hard-Facing of Punches and a Wood-Working Tool.
 P. M. Sapozh. N. P. Trunin, and Ya. F. Kabanov. (Abstracted from Izv. Akad. Nauk SSSR, No. 2, pp. 26-28, 1950, 1949. In Russian.) Successful hard-facing of punches with alloy steel was carried out in presence of graphite or copper anodes surrounding the prepared end of the tool. Covered electrodes were used, the welding current being 45-50 amp. per millimeter of the core diameter. Mechanical working of the hard-face was carried out after annealing, and the metal was then hardened. 4 k.

S-97 T- K-70

E-2

METALLURGICAL LITERATURE CLASSIFICATION

6	5	4	3	2	1	0	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	

SOKOLOV, B.P., *inzh.*; TRONIN, N.P., *inzh.*

Use of plastic concrete in sealing the joints between the sections
of hull structures. *Sudostroenie* 30 no.12:41-42 D '64.
(MIRA 18:6)

SOR:104, U.S.S.R., Inst. of ENGIN. Sci., Inst.; PETROV, B.A., Inst.

Glass-reinforced plastic as a reinforcing means of increasing the strength of reinforced concrete structures. Subatomic 30 (1964) 1876

TRUNIN, N. P.

ELECTRIC HARD FACING OF PUNCHES AND A WOOD WORKING
TOOL P1 M7 SAPOV, N.P. TRUNIN, AND YA. F. KARASEV. (AVTO.
DE.O. 1949, No. 2, pp/ 26-28) (In usian) Success ful
hard facing of punches with alloy steel was car ied out
in speci l graphite or copper moulds surrounding the pre-
pared end of the tool. Covered electrodes were used, the
welding current being 45-50 amp/per millimetre of the core
diameter. Mechanical working of the hard-face was carried
out after annealing, and the metal was then hardened. Sk

TRUNIN, N. P., SAFOV, P. M., KARASEV, Ya. F.

Laboratory Welding Instruments, Rost Agricultural Machine Works, -c1949-.

Engineer

"Electrosmelting of punching dies and woodworking tools," Avtogen. Delo, No. 2, 1949

SAFOV, P. M., TRUDIN, N. P., KARASOV, Ya. P.

Laboratory Welding Instruments, Rost Agricultural Machine Works, -1949-.

Engineer

"Electrosmelting of punching dies and woodworking tools," Avtogen. Delo, No. 2, 1949

SAPOV, P. M., TRUNIN, N. P., KARASEV, Ya. F.

Laboratory Welding Instruments, Rost Agricultural Machine Works, -c1949-.

Engineer

"Electrosmelting of punching dies and woodworking tools," Avtogen. Delo, No. 2, 1949

KURNYCHEV, Yevgeniy Fedorovich; TRUNIN, N.P., dots., retsenzent;
SAAK'YAN, Yu.A., red.; BOROVINSKAYA, L.M., tekhn. red.

[Handbook for the adjusters of machine tools] V pomoshch'
nastroishchiku metallorezhushchikh stankov. Rostov-na-Donu,
Rostovskoe knizhnoe izd-vo, 1963. 122 p. (MIRA 16:10)
(Machine tools)

SOV/20-121-1-17/55

AUTHORS: Al'tshuler, L. V., Bakanova, A. A., Trunin, R. F.

TITLE: Phase Transformations When Water Is Compressed by Strong Shock Waves (Fazovyve prevrashcheniya pri szhatii vody sil'nymi udarnymi volnami)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 121, Nr 1, pp. 67-69 (USSR)

ABSTRACT: This paper gives a report on the shock-like compression of water in the range of pressures from 20 000 to 800 000 atmospheres. On this occasion the kinematic parameters of the shock wave, namely, its velocity of propagation D and mass velocity U of matter behind the wave front, were measured. Because of the laws of conservation of mass and momentum these parameters are connected with the density of the shock-like compression $\rho = \rho_0 D / (D - U)$ and with the pressure $P = \rho_0 D U$; ρ_0 denotes the density of matter before the compression. The method of investigation can be simplified very much when the shock wave is lead to the layer of the substance to be investigated through shields of a material with known

Card 1/2

SOV/20-121-1-17/55

Phase Transformation When Water Is Compressed by Strong Shock Waves

Hugoniot (Gyugonio) adiabatic line of the shock compression. The quantities measurable by experiment are the speed of the shock waves in the shield and in water. The dynamical adiabatic line of water consists of two sections which with their ends fix the region of phase transition. The existence of the phase transition is also proved by the decrease in transparency of water when a shock wave of sufficiently high amplitude of pressure $P > P_1$ goes through. In the case of shock waves with an amplitude of pressure $P < P_1$ the transparency does not change. There are 4 figures and 5 references, 1 of which is Soviet.

PRESENTED: January 17, 1958, by Yu. B. Kharitonov, Member, Academy of Sciences, USSR

SUBMITTED: November 26, 1957

1. Water--Pressure
2. Water--Properties
3. Phase transitions
4. Shock waves--Velocity
5. Shock waves--Physical effects

Card 2/2

62413

S/056/60/038/03/14/033
B006/B014

24.5300
AUTHORS:

Al'tshuler, L. V., Kormer, S. B., Bakanova, A. A., Trunin, R. F.

TITLE:

Equation of State for Aluminum, Copper, and Lead in the High-
pressure Range

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
Vol. 38, No. 3, pp. 790-798

TEXT: In the present paper, the authors discuss the conclusions applying to aluminum, copper, and lead, as result from an equation deviating from the Mie - Grueneisen solid-state equation. The equation considered by the authors deviates in that it holds within a wide pressure- and temperature range, and that the thermal electron components of energy and pressure are taken into account. Moreover, data are furnished concerning dynamic compression of aluminum up to pressures of $2 \cdot 10^6$ atm, and results of new measurements of the compressibility of copper, lead, and iron at 10^6 , $2 \cdot 10^6$, and $4 \cdot 10^6$ atm are offered. Numerous theoretical and experimental details concerning the adiabatics of these three metals are discussed in the introduction, with special regard to the collision adiabatics (Ye. I. Zababakhin, Yu. F. ~~X~~)

Card 1/3

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Equation of State for Aluminum, Copper, and Lead
in the High-pressure Range

S/056/60/038/03/14/033
B006/B014

Alekseyev). Ansatzes for the equation of state and internal energy have the form $P = P_{int} + P_{therm} + P_{exc}$ and $E = E_{int} + E_{therm} + E_{exc}$ (2). The first terms of these sums characterize the interaction of atoms at 0°K, the second terms are thermal ones determined by lattice vibrations, and the third terms are determined by the thermal excitations of electrons. In the following, the various terms are written down explicitly; and finally, the following explicit expressions are obtained for pressure and temperature:

$$P = P_{int} + \frac{d_p C_{vp}}{v} [T - T_0 + E_0 / C_{vp}] + \frac{1}{4} \beta_0 \beta_0 (v_0/v)^{1/2} T^2 \text{ and}$$

$$E = \int_v^{v_0} P_{int} dv + E_0 + C_{vp}(T - T_0) + \frac{1}{2} \beta_0 (v/v_0)^{1/2} T^2. \text{ According to equation (1)}$$

for the dynamic adiabatics $P_G = \sum a_k (\sigma - 1)^k$, dynamic experiments permitted a determination of pressure P_G and also of energy $E_G = E_0 + \frac{1}{2} P_G (v_0 - v)$. Results of computations for aluminum are given in Table 5, for copper in Table 6, and for lead in Table 7. As is shown by Figs. 1 and 2, thermal

✓

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92b15

Equation of State for Aluminum, Copper, and Lead
in the High-pressure Range

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pressure plays an important part in the compression of metals by strong shock waves. For the pressures $216 \cdot 10^{10}$ bars (Al), $388 \cdot 10^{10}$ bars (Cu), and $401 \cdot 10^{10}$ bars (Pb), the thermal pressure components amounted to $59 \cdot 10^{10}$, $115 \cdot 10^{10}$, and $124 \cdot 10^{10}$ bars. For the same pressures, the thermal energy component was 57% (Al), 60% (Cu), and 69% (Pb). Finally, the authors thank A. I. Funtikov, R. V. Malyshev, and I. P. Dudoladov, as well as Professor K. A. Semendyayev for their assistance, advice, and discussions. L. D. Landau is also mentioned in this article. There are 2 figures, 7 tables, and 14 references, 4 of which are Soviet. X

SUBMITTED: October 7, 1959

Card 3/3

34000

S/056/62/042/001/015/048
B104/B102

18.8100

AUTHORS: Al'tshuler, L. V., Bakanova, A. A., Trunin, R. F.

TITLE: Shock adiabats and zero isotherms of seven metals at high pressures

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 1, 1962, 91-104

TEXT: The wave velocity D and the mass velocity U behind the shock-wave front were measured in Fe, Ni, Cu, Zn, Cd, Sn, and Pb. Pressure and degree of compression were determined from $P = \rho_0 DU$ and $\sigma = D/(D-U)$. By passing from the shock adiabat to the zero isotherm, the following simple equations were obtained for pressure and energy: ✓

$$P_x(\delta) = Q [\delta^{1/2} \exp \{q(1 - \delta^{-1/2})\} - \delta^{1/2}],$$

$$E_x(\delta) = (3Q/\rho_0 k) [q^{-1} \exp \{q(1 - \delta^{-1/2})\} - \delta^{1/2}]$$

where Q and q are unknown constants, $\delta = v_0/v$, v being the specific volume,

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S/056/62/042/001/015/048
B104/B102

Shock adiabats and zero isotherms...

and $v_0 = v$ at $P = 0$ and $T = T_0$. In the case of ionic compounds, the first terms in (5) determine the ionic repulsion potential and the second terms determine the Coulomb attraction. In the case of metals, the positive and the negative term in (5) express the repulsive and the attractive forces, respectively. Similar equations were obtained for transition metals in the same way. Shock adiabats and zero isotherms were approximated by a suitable combination of Q and q (Figs. 5 and 6). Using the equation $P_{x,extra} = b + B(\sigma - a)^n$, the zero isotherms were extrapolated into pressure and density ranges, to which quantum statistical methods are applicable. The extrapolation constants are presented in Table 8. K. K. Krupnikov, M. I. Brazhnik (ZhETF, 34, 886, 1958), S. B. Kormer, V. D. Urlin, L. T. Popova (FTT, 2, 223, 1961), V. S. Zharkov, and V. A. Kalinin (DAN SSSR, 135, 811, 1960) are mentioned. V. N. Zubarev is thanked for his assistance in interpreting experimental data, M. I. Brazhnik, A. A. Gubkin, and I. P. Dudoladov for their help in experiments and calculations, and S. B. Kormer and V. D. Urlin for discussions. There are 9 figures, 8 tables, and 14 references.

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34000

S/056/62/042/001/015/048
B104/B102

Shock adiabats and zero isotherms...

9 Soviet-bloc and 5 non-Soviet-bloc. The four most recent references to English-language publications read as follows: R. G. McQueen, S. P. Marsh. J. Appl. Phys. 31, 1253, 1960; J. M. Walsh et al. Phys. Rev. 108, 196, 1957; J. J. Gilvarry. Phys. Rev. 102, 317, 1956; J. S. Dugdale, D. K. McDonald. Phys. Rev., 89, 832, 1953.

SUBMITTED: August 10, 1961

Table 1. Experimental results. Legend: (1) shock-wave parameters.

Table 2. Experimental results. Legend: (1) material of impact mass; (2) velocity of impact mass. ✓

Table 8. Extrapolation constants.

Fig. 5. Shock adiabats and zero isotherms of Ni and Zn.

Fig. 6. Shock adiabats and zero isotherms of Fe.

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TRUNIN, R.F.

AID Nr. 971-19 20 May

IMPACT COMPRESSIBILITY OF Ti, Mo, Ta, and Fe (USSR)

Krupnikov, K. K., A. A. Bakanova, M. I. Brazhnik, and R. F. Trunin. IN:
Akademiya nauk SSSR. Doklady, v. 148, no. 6, 21 Feb 1963, 1302-1305.
S/020/63/148/006/012/023

The impact compressibility of Ti, Mo, and Ta at pressures up to $5 \cdot 10^6$ atm, and of Fe at a pressure of $\sim 9 \cdot 10^6$ atm, has been determined. The pressure was generated by shooting aluminum plates at a velocity of 5600 m/sec or steel pins at a velocity of 8640 or 9100 m/sec onto test specimens 3-4 mm thick which were shielded by an Al or Fe shield. The pressure and the degree of compression were calculated from the experimentally determined velocity D of the shock wave. The state of impact compression and the values of pressure P and mass velocity behind the front of shock wave U were determined graphically. The compression density ρ was calculated from the equation $\rho_0 D = \rho(D-U)$, where ρ_0 is the initial density. From the obtained shock-wave parameters the adiabatic curves for shock waves and zero isotherms were calculated and plotted.

[MS]

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L 9433-66 EWT(1) GW

SOURCE CODE: UR/0387/65/000/009/0001/0012

ACC NR: AP5025074

AUTHORS: Trunin, R. F.; Gon'shakova, V. I.; Simakov, G. V.; Galdin, N. Ye. 41
44.55 44.55 44.55 3

ORG: none

TITLE: A study of rocks under the action of the high pressures and temperatures of shock compression

SOURCE: AN SSSR. Izvestiya. Fizika Zemli, no. 9, 1965, 1-12

TOPIC TAGS: geophysical research, geophysics, earth science, earth crust, seismology, PETROLOGY
12,44,55

ABSTRACT: A discussion of the results obtained in an experimental study of the shock compressibility of alkaline and ultra-alkaline rocks under various pressures is presented. The theoretical sequence of transitions in the structure of the earth's mantle (see A. E. Ringwood. Mineralogical Constitution of the Deep Mantle, J. Geoph. Res., 67, No. 10, 1962) is discussed in some detail. Eleven alkaline and ultra-alkaline rocks (mineral groups of magnesium, plagioclase, titanomagnetite, chromite, biotite, and serpentine) were used as test specimens.

UDC: 550.311;539.89

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L 9433-66

ACC NR: AP5025074

A table showing the mineral content and density of the rock specimens is included. The method of determining the dynamic compressibility of the substances is based upon the measurement of the kinematic parameters of shock waves: the velocity of propagation of the wave D and the mass velocity of motion of the substance beyond the front U . These quantities are related to pressure according to

$$P = \rho_0 D U$$

and to the degree of compression according to

$$\sigma = \frac{\rho}{\rho_0} = \frac{D}{D - U}$$

where ρ_0 is the initial density and ρ is the density beyond the shock front. The experimental technique of measuring the dynamic compressibility follows the method of reflection (L. V. Al'tshuler, K. K. Krupnikov, and M. I. Vrazhnik. *Dinamicheskaya szhimayemost' metallov pri davleniyakh ot 400 000 do 4 000 000 atmosfer. Zh. eksperim. i teor. fiz.*, 34, vyp. 4, 1958). The experimental results are tabulated, and graphs showing the variation of D vs U are presented. The results were studied in order to compare groupings of the experimental data in an effort to match the $P - \rho$ curve characteristic of the earth." The authors

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ACC NR: AP5025074

conclude with some deductions of the consistency and uniformity of the B and D layers of the earth's mantle. Orig. art. has: 6 figures, 3 tables, and 3 equations.

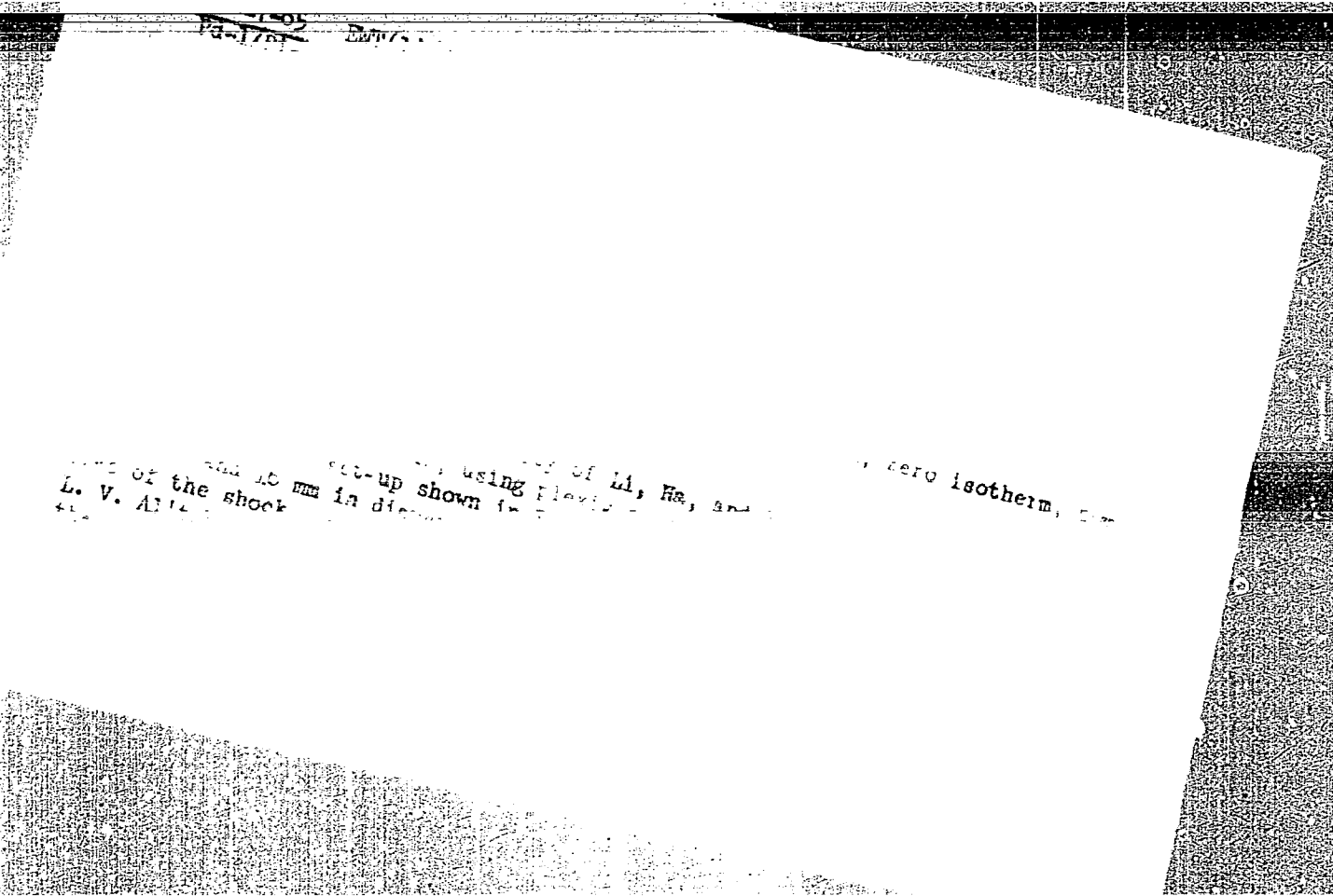
SUB CODE: 08/

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ORIG REF: 016/

OTH REF: 019

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Card 3/3



are attributed to the trans-
Orig. art. has: 6 figures, 6 formulas, and 4 tables.

ASSOCIATION: none

SUBJECT: 202064

ENCL: 01

SUB CODE: IC, ME

PRYAKHIN, V.A., inzh.; TRUNIN, S.F., inzh.; NOVOSEL'TSEV, P.I., inzh.

Type GR-3 explosion-proof mine locomotive with gyroflywheel. Ugol'
Ukr. 4 no.10:40-41 O '60. (MIRA 13:10)
(Mine railroads) (Gyroscope)

KHLISTUN, V.I., inzh.; TRUNIN, S.F., inzh.

Results of factory tests of leading models of the GR-4 mine
gyroflywheel locomotive. Vop. rud. transp. no.5:324-336 '61.
(MIRA 16:7)

1. Teretskiy mashinostroitel'nyy zavod.
(Mine railroads—Testing)
(Gyroscopic instruments)

TRUNIN, V., inzh.

Strength, tensile and vibration testing machines. Isobr.1 rats.
no.1:35-36 Ja '61. (MIRA 14:1)
(Moscow--Exhibitions)
(Germany, East--Testing machines)

TRUNIN, V., inzh.

The International Automatic Control Federation is the forum for
automation. Izobr.i rats. no.10:17-18 0'60. (MIRA 13:10)

1. Vychislitel'nyy tsentr AN SSSR.
(Automation--Congresses)

TRUHIN, V.G.; NIKITIN, A.I.; GRISHKO, S.P.

The TV-4 thickness measuring instrument. Biul.tekh.-ekon.inform.
no.9:38-40 '60. (MIRA 13:10)


(Thickness measurement)

S/193/60/000/009/008/013
A004/A001

AUTHORS: Trunin, V.G., Nikitin, A.I., Grishko, S.P.

TITLE: The TB (TV)-4 Thickness Gage Ψ

PERIODICAL: Byulleten' tekhniko-ekonomicheskoi informatsii, 1960, No. 9,
pp. 38-40

TEXT: The Ukrainskiy nauchno-issledovatel'skiy trubnyy institut (UkrNITI) 
(Ukrainian Scientific Research Institute for Tubes) has developed in 1959 the
TV-4 thickness gage for the measurement of the wall thickness and nonuniformity
in thickness of tubes of nonmagnetic metals. With the corresponding graduation,
the device can be used for the measurement of tube and rod diameters. The
operating principle of the thickness gage is based on eddy currents. The device
is composed of the tube generator, pick-ups, amplifier, indicator, automatic
switch-off unit of the tube-drawing mechanism and power unit. The automation
unit is represented by two trigger circuits, of which one acts on thinning, the
other on thickening, while simultaneously signal lamps are lighted and the motor
of the tube-drawing mechanism is switched off. For the connection of a recorder,
a cathode follower is included in the device. A number of outside factors affect

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The TB (TV)-4 Thickness Gage

S/193/60/000/009/008/013
A004/A001

the indicating accuracy of the device, such as diameter and ovalness of the tubes, electric conductivity of the metal, distance of the pick-up from the metal and temperature of surrounding medium. The effects of these factors can be eliminated by using various constructional and radiotechnical methods and utilizing the dependence of the readings of the device on the tube diameter. Owing to the use of the method of constant unbalance and the special automation unit, it is possible to measure with a high degree of accuracy the nonuniformity in pipe thickness and switch off the tube-drawing mechanism if the given allowances are exceeded. The reading instability of the device does not exceed 2μ in the course of 8 hours. The time constant of the device is equal to 15 milliseconds. The author presents the following technical data: measuring range of tube wall thickness = 0.1-3.0 mm; range of tube diameters = 8-60 mm; measuring error of thickness = 1%; scale multiplying factor for the measurement of thickness = 10μ ; scale multiplying factor for the measurement of nonuniformity of pipe thickness = 10μ ; permissible voltage variations of the mains: from -15 to +10%; required power = 140 w; overall dimensions of the device (length x width x height) = 500 x 300 x 300 mm; weight = 19 kg. There is 1 figure.

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S/263/62/000/011/005/022
1007/1207

AUTHOR: Trunin, V. G. and Nikitin, A. I.

TITLE: Wall thickness measurements in austenitic steel pipes by attachable induction-coils

PERIODICAL: Referativnyy zhurnal, otdel'nyy vypusk. 32. Izmeritel'naya tekhnika, no. 11, 1962, 16, abstract 32.11.97. In collection: "Proiz-vo trub" Kharkov, Metallurgizdat, no. 5, 1961, 175-181

TEXT: Results of investigation of wall-thickness measurements by eddy currents created in an attachable induction-coil, are reported and a device of the TB-5 (TV-5) type, designed on the basis of these results, is described. The device is intended for one-side measurement of wall thickness differences in austenitic steel pipes of the size of $8-60 \times 0.2-0.6$ mm, with a maximum measuring error of 1% and a measuring rate of 1-3 m/min. The thickness gage contains a current generator, two induction transducers, an amplifier, an electric indicating device and an automatic unit for disconnecting the pipe-feeding mechanism and for control of the optical signaling system. Alternating voltage is applied to the primary (winding) of the transducers, whose magnetic flux induces in the walls of the pipe to be measured, eddy currents that weaken the intensity of the primary magnetic flux. The self-induction electromotive force generated in the secondary windings is proportional to the wall thickness of the pipe. The difference between the opposite-connected secondary windings is amplified and fed to the indicating device. There are 7 figures and 4 references

[Abstracter's note: Complete translation.]

Card 1/1