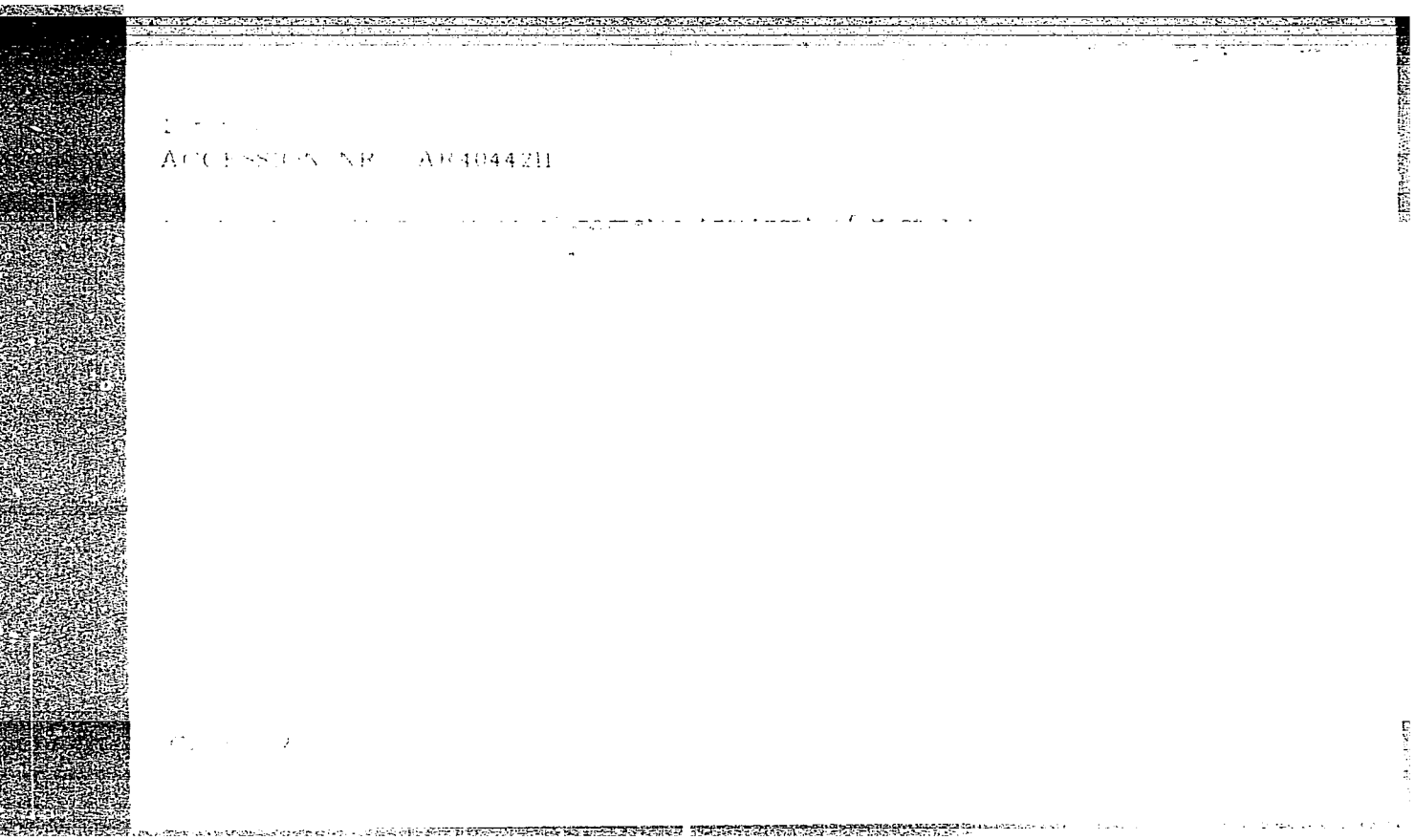
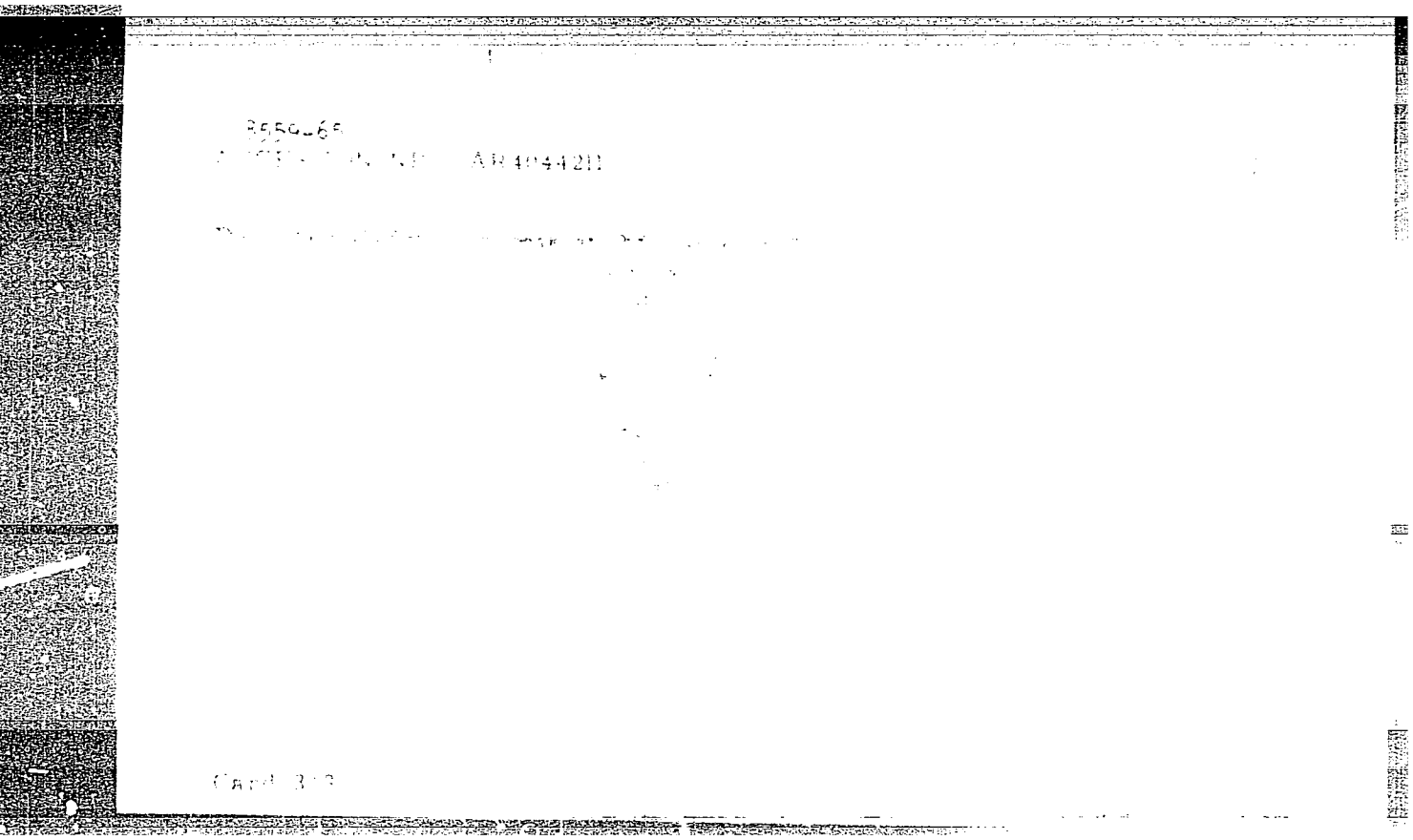




EWP(q)/EWT(m)/BDS--AFFTC/ASD--JD/JG
L 11203-63
ACCESSION NR: AP3000490 S/0129/63/000/005/0049/0054 51

AUTHOR: Bernshteyn, M. L.; Demina, E. L.; Liberman, Ye. E.; Chernukha, L. G. 56

TITLE: Polygonization in molybdenum and its alloys. 27

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 5, 1963 49-54

TOPIC TAGS: polygonization in molybdenum, zirconium, titanium

ABSTRACT: Authors made tests on molybdenum which was obtained by powder metallurg method, on cast molybdenum, on cast molybdenum alloys with admixtures of zirconium titanium as well as cast molybdenum alloys with simultaneous admixtures of zirconium and titanium. For selection of recrystallization conditions, the samples were heated to 1250, 1300, 1400, 1500 and 1600 degrees with holding at 5, 10, 15, 20 and 30 minutes. The microstructures were studied and optimum annealing conditions were established. In addition, treatment conditions were established which produced the most developed polygonized structure in the molybdenum and its alloys. Microstructure testing was done by subjecting the samples to deformation, deformation and annealing at 1000-1600 degrees, and, finally, after deformation and double annealing at polygonization and higher temperatures. The changes in the structure of molybdenum and its alloys were also studied in relation to

Card 1/2

L 11203-63
ACCESSION NR: AP3000490

holding period at optimum treatment conditions. Authors conclude that polygonization raises the temperature of subsequent recrystallization which is important for employing molybdenum and its alloys at elevated temperatures. As a result of development of polygonization in the tested materials, an increase of resistance to small plastic deformations occurs. Orig. art. has: 6 figures.

ASSOCIATION: Moskovskiy institut stali i splavov (Moscow Institute for Steels and Alloys)

SUBMITTED: 00	DATE ACQD: 03Jun63	ENCL: 00
SUB CODE: 00	NO REF SOV: 000	OTHER: 000

Card 2/2

L 20021-65 EWT(m)/EWA(d)/T/EWP(t)/EWP(k)/EWP(b) ...

TRANSLATION: The effect of hot rolling[8] (300 and 500°) in combination

Card 1/2 *[So cited in original Ref. 3h.]

L 20821-65
ACCESSION NR: AR4048249

0

were annealed for 1 hr at 250, 350, and 500°. As a result of thermomechanical treatment the strength properties of Ti increased [illegible] its properties after [illegible]

[illegible] rolling at [illegible] with shrinkage of 20% with subsequent [illegible]

SUB CODE: MM ENCL: 00

Card 2/2

BORZDYKA, A.M., doktor tekhn. nauk; TSEYTLIN, V.Z., kand. tekhn. nauk; BERNSHTEYN, M.L., doktor tekhn. nauk, prof., retsenzent

[Heat treatment of heat-resistant steels and alloys] Termicheskaia obrabotka zharoprochnykh stalei i splavov. Moskva, Mashinostroenie, 1964. 246 p. (MIRA 17:9)

ACCESSION NR: AP4010067 S/0129/64/000/001/0012/0013

AUTHORS: Bernshteyn, M.L.; Birman, S.R.; Demina, E.L.

TITLE: Investigation of polygonization in nichrome

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 1, 1964, 12-13

TOPIC TAGS: nichrome, Kh20N80 alloy, plastic deformation, elastic limit, polygonization, annealing

ABSTRACT: The conditions for treating Kh20N80 alloy causing polygonization were established. As a result of polygonization the resistance to small plastic deformation is increased 1.5-2 times. Annealing for 1 hour at 850C increases resistance to 1% deformation at 450C by 1.5 times; this value is increased somewhat more by annealing for 100 hours, then it decreases. For 4% deformation at 450C, optimum annealing is for 1 hour at 750C (increasing resistance 2 times); further annealing up to 40 hours reduces the elastic limit and with longer annealing the elastic limit remains

Card 1/2

ACCESSION NR: AP4010067

constant. Orig. art. has: 2 figures.

ASSOCIATION: Moskovskiy institut stali i splavov (Moscow Steel and Alloy Institute)

SUBMITTED: 00 DATE ACQ: 07Feb64 ENCL: 00

SUB CODE: ML NO REF SOV: 000 OTHER: 000

Card 2/2

ACCESSION NR: AP4019482 S/0133/64/000/003/0269/0270

AUTHORS: Kal'ner, V. D.; Kossovskiy, L. D.; Bernshteym, M. L.

TITLE: Thermomechanical treatment of 55KhGR steel springs

SOURCE: Stal', no. 3, 1964, 269-270

TOPIC TAGS: steel, 55KhGR steel, spring band, thermal treatment of steel, mechanical treatment of steel, rolling 55KhGR steel, hardening, compressed air hardening, water hardening, tempering, 300-2 rolling mill

ABSTRACT: A series of experiments was performed in Chelyabinskiy metallurgicheskiy zavod (Chelyabinsk Metallurgical Plant) on the different thermal and mechanical treatments of steel spring bands. The samples were made of 55KhGR steel, were 7.5 x 63 mm in size, and their chemical composition (%) was:

C	Mn	Si	S	P	Cr	Ni	Cu	B
0.58	1.06	0.27	0.014	0.021	1.13	0.16	0.15	0.0023

After hot rolling at 930-950C in the 300-2 mill, the samples were hardened in a jet of compressed air or in water. Their hardness was 57-58 and 60-61 R_C. They showed no usual cracking after water hardening (due to an increase of their

Card 1/2

ACCESSION NR: AP4019482

residual plasticity). They were tempered at 240-265C. It was established that a combined thermal and mechanical processing resulted in a good combination of high strength and the desired plasticity. The assemblies for thermomechanical treatment of steel spring bands are not complicated, can be installed in any plant, and may be used in mass production operations. The strength and plasticity values of the 55KhGR spring bands obtained in a continuous rolling mill were much higher than those obtained in the laboratory. The hardening effect of the thermomechanical treatment produced lasting results. Orig. art. has: 3 tables and 2 figures.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 27Mar64 ENCL: 00

SUB CODE: ML NO REF SOV: 002 OTHER: 000

Card 2/2

ACCESSION NR: AP4037064 S/0129/64/000/005/0010/0013

AUTHOR: Chudnovskaya, L. A.; Bernshteyn, M. L.; Granik, G. I.; Gladshteyn, V. A.

TITLE: Thermomagnetic Tempering of "R-18" Steel

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 5, 1964, 10-13

TOPIC TAGS: austenite transformation, variable magnetic field, tempering, bend test, automated heat treatment, high speed steel

ABSTRACT: The authors consider the possibility of accelerating the austenite transformation during magnetic tempering of high-speed steel in: (1) 75 mm-long specimens prepared from a ground rod with an 8 mm diam used for the determination of the amount of residual austenite and Hc; (2) 30 mm-long dilatometric specimens prepared from a ground rod with a 3 mm diam; and (3) 4.5 x 4.5 x 50 mm specimens prepared from 25 x 15 mm hot-rolled strip for bending tests. Tempering with the application of a 600 and 1200 e variable magnetic field greatly accelerates the transformation of residual austenite at 550-560 C; 30 min. holding results in complete transformation. The magnetic field has the same effect when applied during holding and quenching. Bending strength is enhanced at all temperatures.

Card 1/2

ACCESSION NR: AP4037064

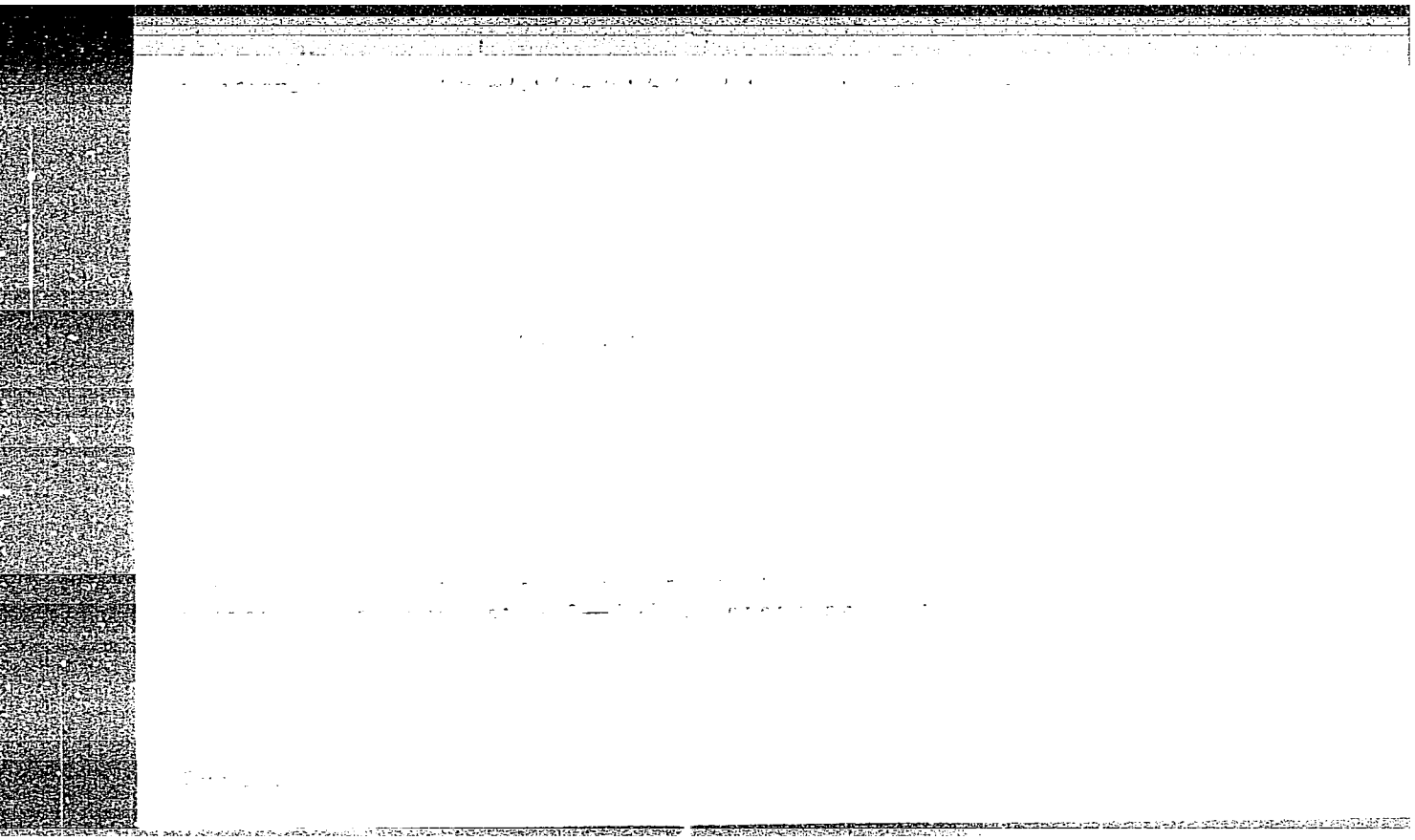
The application of a magnetic field enhances austenite decomposition time by one and a half after a 500 C temper, 60 min holding period and quenching from 1300 C. Residual austenite content was 3% as against 10% without a magnetic field. The expedience of replacing the current technique of prolonged triple tempering by single tempering and the employment of a magnetic field was tested by the authors in 6 mm-diam. drills hardened by heating to 1280 C in a salt bath for 1.5 minutes and cooling in saltpeter to 400-500 C. After pickling the specimens were subjected to various tempering conditions with and without a magnetic field. The authors found that accelerated magnetic field tempering would make automation possible in the heat treatment of high-speed steel tools. Orig. art. has: 6 figures.

ASSOCIATION: Moskovskiy institut stali i splavov (Moscow Institute of Steel and Alloys), VNII (All Union Scientific Research Institute)

SUBMITTED: 00 DATE ACQ: 05Jun64 ENCL: 00

SUB CODE: MM NO REF SOV: 001 OTHER: 000

Card 2/2



APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000205020008-4"

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000205020008-4"

BRON, D.I.; BERNSHTEYN, M.L., doktor tekhn.nauk; RAKHSHTADT, A.G., kand. tekhn.nauk; LEVITES, I.I.

Hardening 55KhGR spring steel by the method of high-temperature thermomechanical treatment. Avt.prom. 30 no.1:35-38 Ja '64. (MIRA 17:3)

1. Nauchno-issledovatel'skiy tekhnologicheskiy institut avtomobil'noy promyshlennosti, Moskovskiy institut stali i splavov i Moskovskoye vyssheye tekhnicheskoye uchilishche imeni Baumana.

BERNSHTEYN, M.L.; YELAGINA, L.A.; FATKULLINA, L.P.; Prinimali uchastiye: KHROMEYEV, Yu.V.; SEMENOVA, N.M.

Thermomechanical treatment of VTZ1 VT8 and VT14 titanium alloys. TSvet. met. 37 no.12:80-83 D '64 (MIRA 18:2)

POGODIN-ALEKSEYEV, G.I., doktor tekhn. nauk, prof., otv. red.;
RAKHSHTADT, A.G., kand. tekhn. nauk, dots., nauchn. red.;
SHREYBER, G.K., kand. tekhn. nauk, dots., nauchn. red.;
BERNSHTEYN, M.L., doktor tekhn. nauk, red.; LAKHTIN, Yu.M., doktor tekhn. nauk, prof., red.; RUSTEM, S.L., kand. tekhn. nauk, dots., red.; FEDOTENKO, N.S., inzh., red.

[Study of metals and their heat treatment] Metallovedenie i termicheskaia obrabotka. Moskva, Mashinostroenie, 1964. 195 p. (MIRA 18:7)

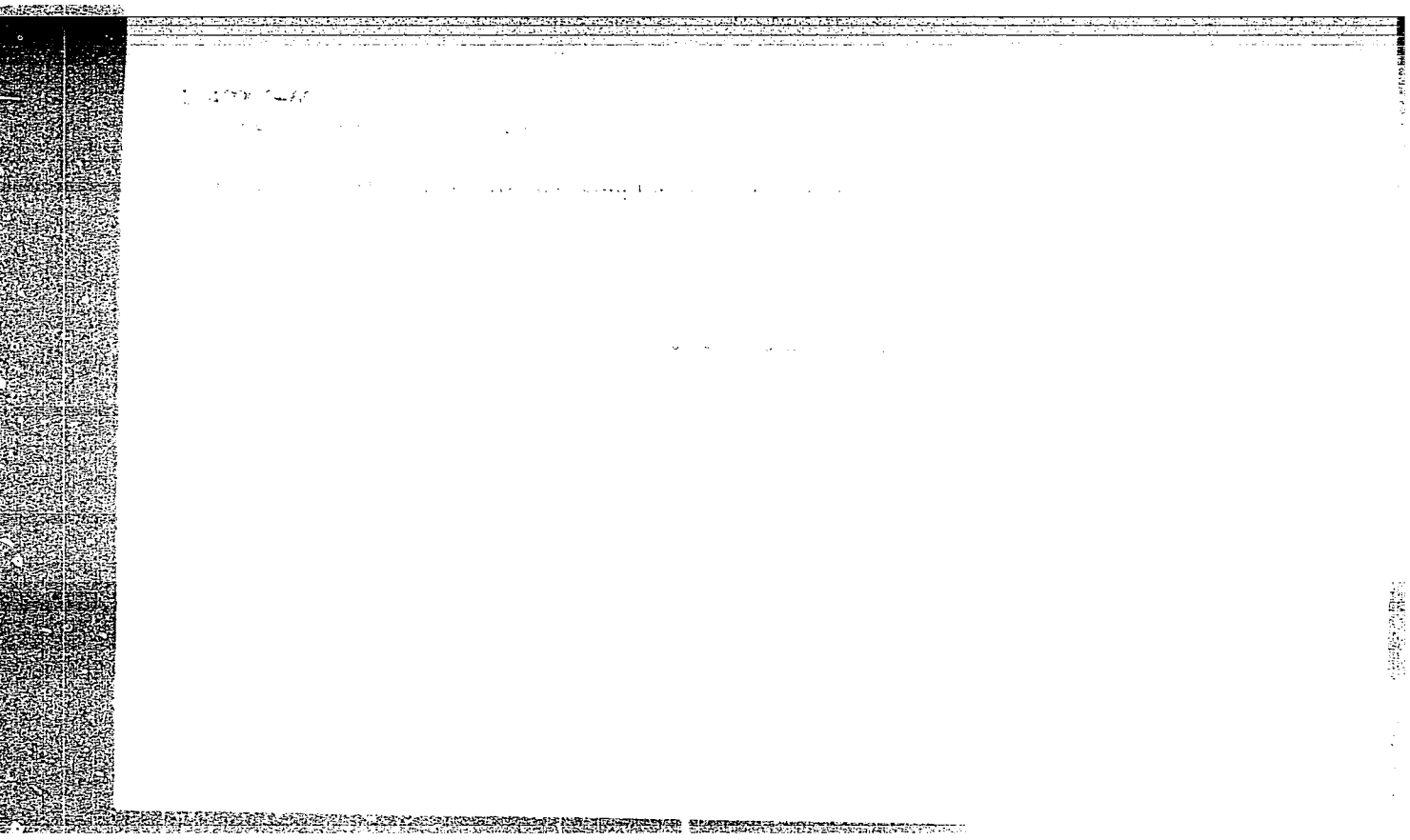
1. Nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy promyshlennosti. Sektsiya metallovedeniya i termicheskoy obrabotki.

BERNSTEIN, M.L. [Bernshteyn, M.L.]

Thermomechanical treatment of steels. Koh lap 98 no.1:1-6 Ja '65.

1. Moscow Steel Institute.

AUTHOR: Bernshteyn, M. L.; Cherepanova, G. I.



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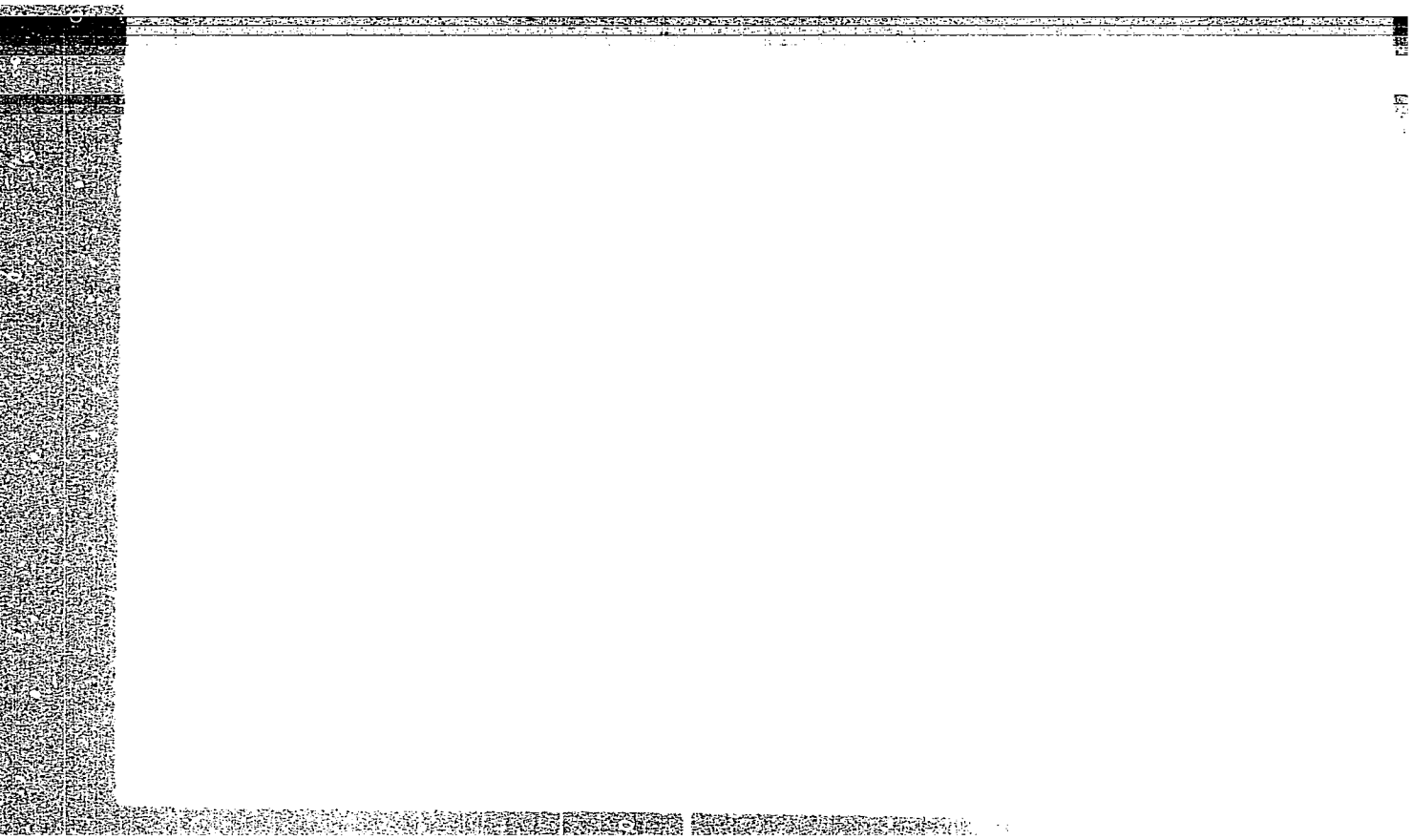

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000205020008-4"

[illegible] tables and 4 figures.

BERNSHTEYN, M.L.

Reviews. Zashch.met. 1 no.4:456-457 Jl-Ag '65.

(MIRA 18:8)

L 1334-66 EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b)/EWA(c) MJW/JD

ACCESSION NR: AP5022404 UR/0369/65/000/004/0473/0476

AUTHOR: Marko, Y.; Bernshteyn, M. L.

TITLE: Strengthening of thermomechanically worked 55KhFA steel by means of cold deformation of martensite

SOURCE: Fiziko-khimicheskaya mekhanika materialov, no. 4, 1965, 473-476

TOPIC TAGS: material deformation, martensite, thermomechanical property, steel/55KhFA steel

ABSTRACT: The effect of cold deformation of martensite on mechanical properties of thermomechanically worked steel was studied on 55KhFA steel samples. The 55KhFA steel composition was 0.50% C, 0.65% Mn, 0.25% Si, 1.28% Cr, 0.17% V, 0.02% P, and 0.02% S. The 0.8 ton ingots were tempered at 700°C for 2 hours and cut. The hardening was carried out by means of heating to 870°C, quenching in oil, and tempering for 2 hours at 200°C. The high temperature thermal working was conducted as follows: austenization at 900°C in a furnace was followed by quenching in oil, forging into bars with 5.4 mm in diameter, tempering for 2 hours at 200°C, and grinding to 4 mm in diameter. Samples with 4 mm in diameter and 40 mm in length were deformed

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L 1334-66

ACCESSION NR: AP5022404

2

by stretching on a "Mor and Federgaf" tensile testing machine. The degress of martensite deformation were 0, 0.6, 1, 2, and 3%. After deformation, samples were either tempered for 2 hours at 200°C or not tempered. The dependence of mechanical properties, endurance limit σ_b, proportionality limit $\sigma_{0.02}$, and braking elongation ψ, of quenched and deeply tempered 55KhFA steel samples upon the degree of martensite deformation are shown in fig. 1 of the Enclosure. In general, cold working was observed to have a beneficial effect on the mechanical properties of 55KhFA steel. Orig. art. has: 2 figures, 3 tables.

ASSOCIATION: Moskovskiy institut stali i splavov (Moscow Institute of Steel and Alloys)

SUBMITTED: 11Mar65 ENCL: 01 SUB CODE: MM

NO REF SOV: 003 OTHER: 004

Card 2/3

L 1334-66

ACCESSION NR: AP5022404

ENCLOSURE: 01

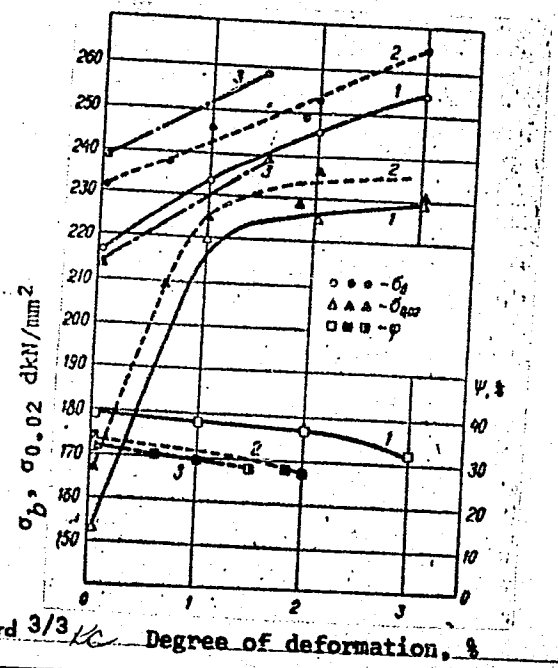
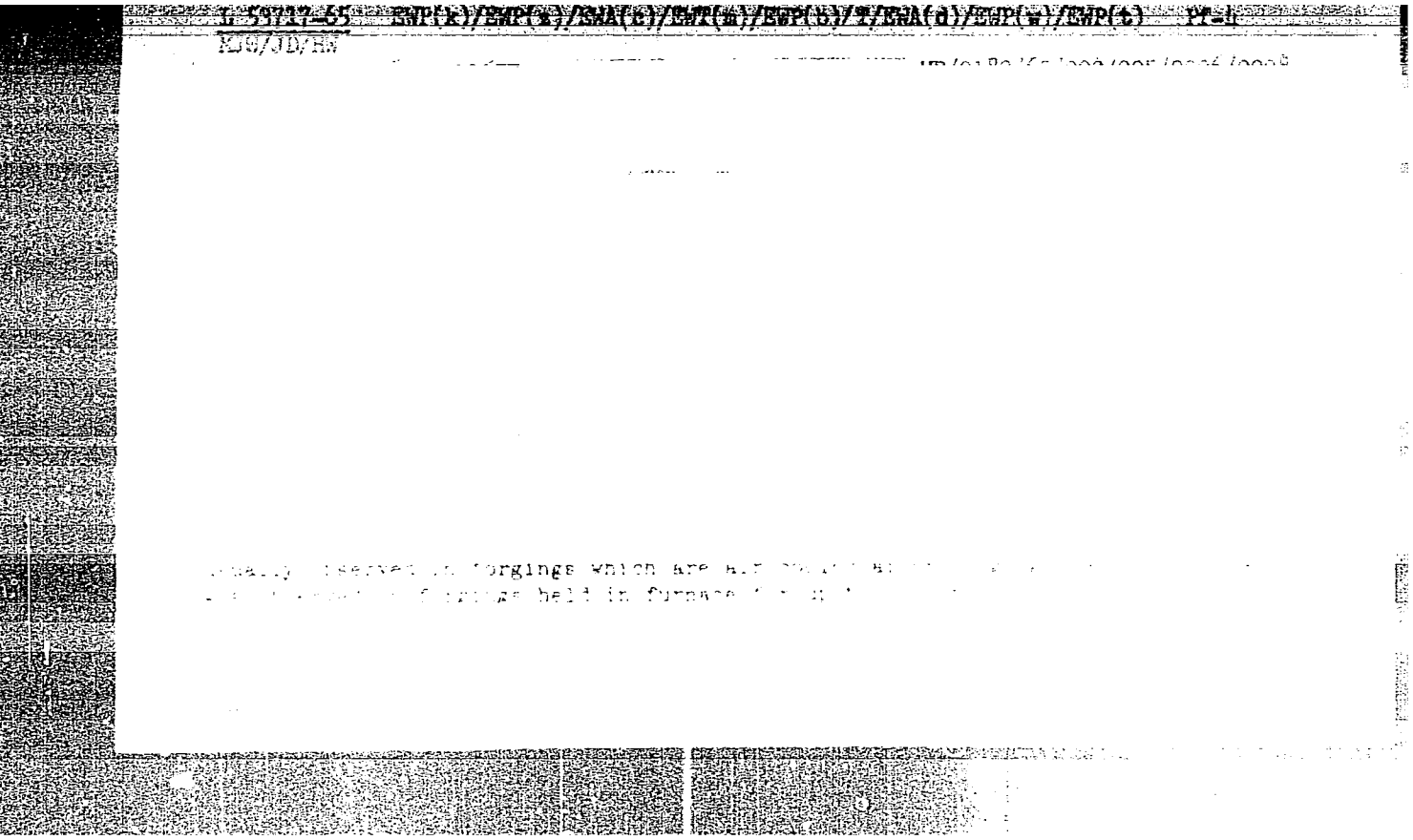
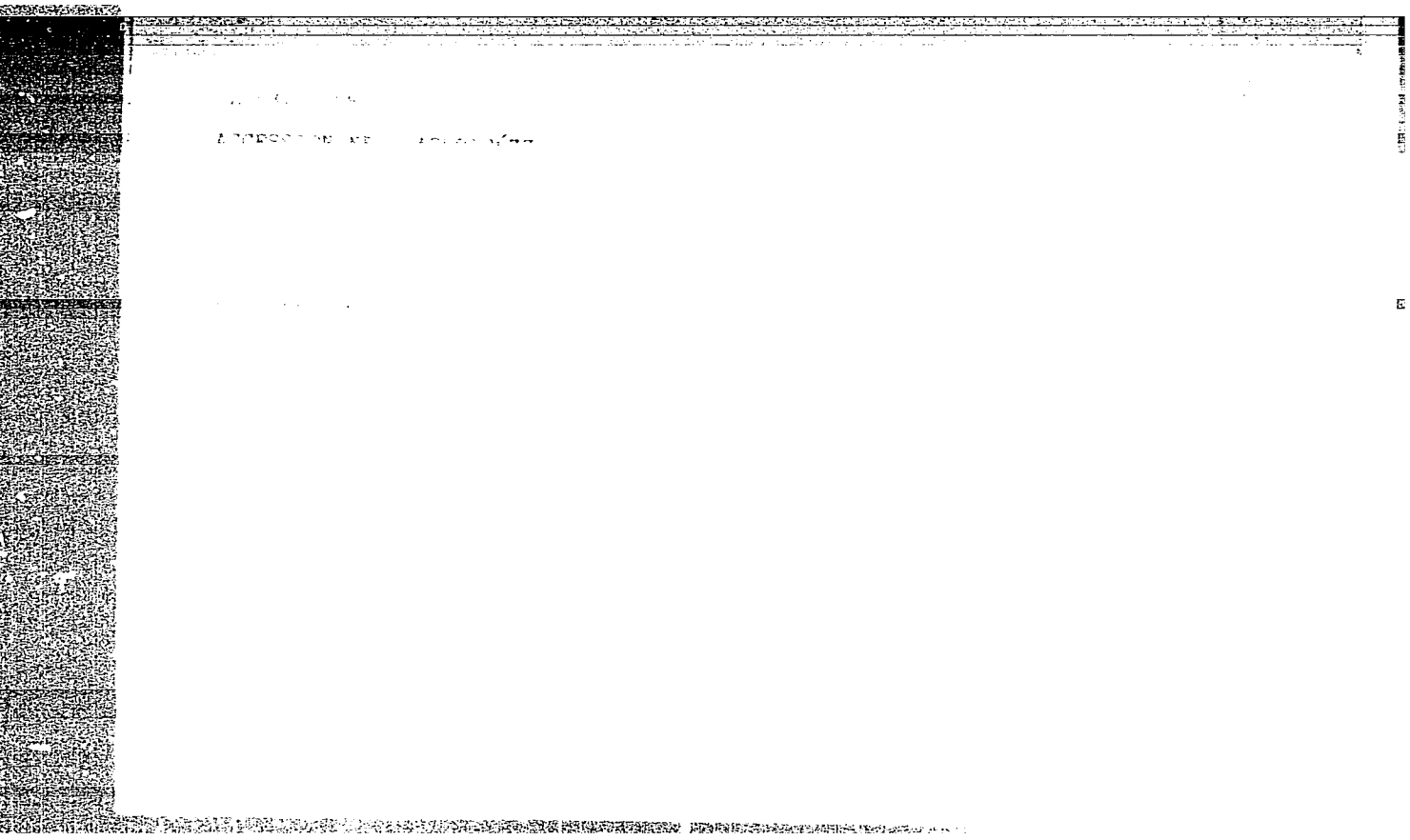


Fig. 1. 1--conventional quenching and tempering for 2 hours at 200°C; 2--high temperature thermomechanical working followed by tempering for 2 hours at 200°C; 3--high temperature thermomechanical working followed by cold working and tempering for 2 hrs. at 200°C.

Card 3/3 KC





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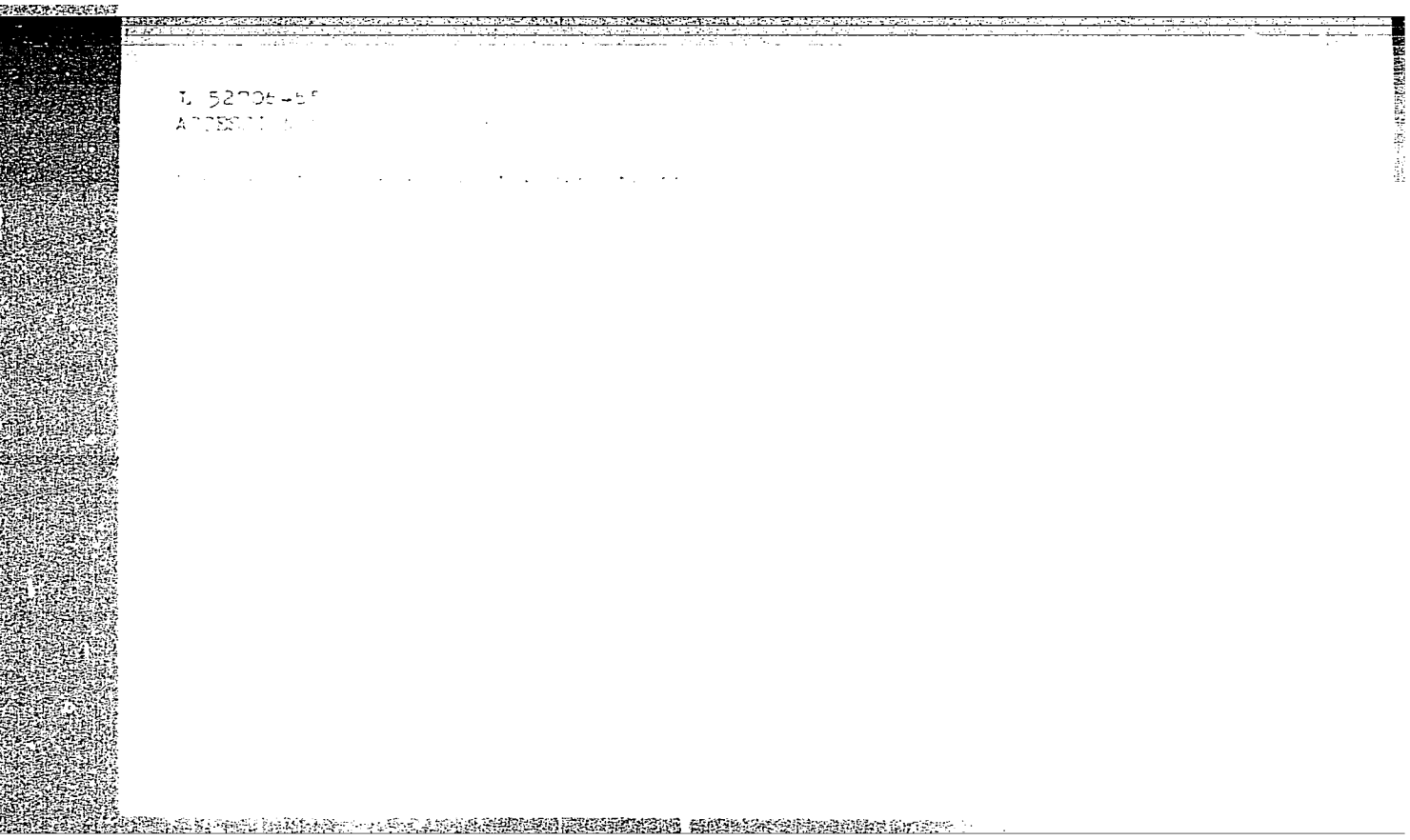
L 52706-65 EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c) Pf-4

structure and phase composition of titanium alloys has been studied. The



TITLE: Thermomechanical treatment of tubes for the petroleum industry

ABSTRACT: The effect of high temperature thermomechanical treatment

the end portion of the tube was cut off and water quenched from

σ = 170—190 kg/mm², δ = 8—9.5%, [illegible] = 45—48°, [illegible]
the tensile strength of DB steel after [illegible] was 20 kg/mm² greater
and that of 36G2S steel was 55 kg/mm² higher than those obtained by
other heat treatments. The difference in the strength [illegible]

[illegible] Metallurgy (Institut stali i splavov
for Steel and Alloys)

Card 2/3

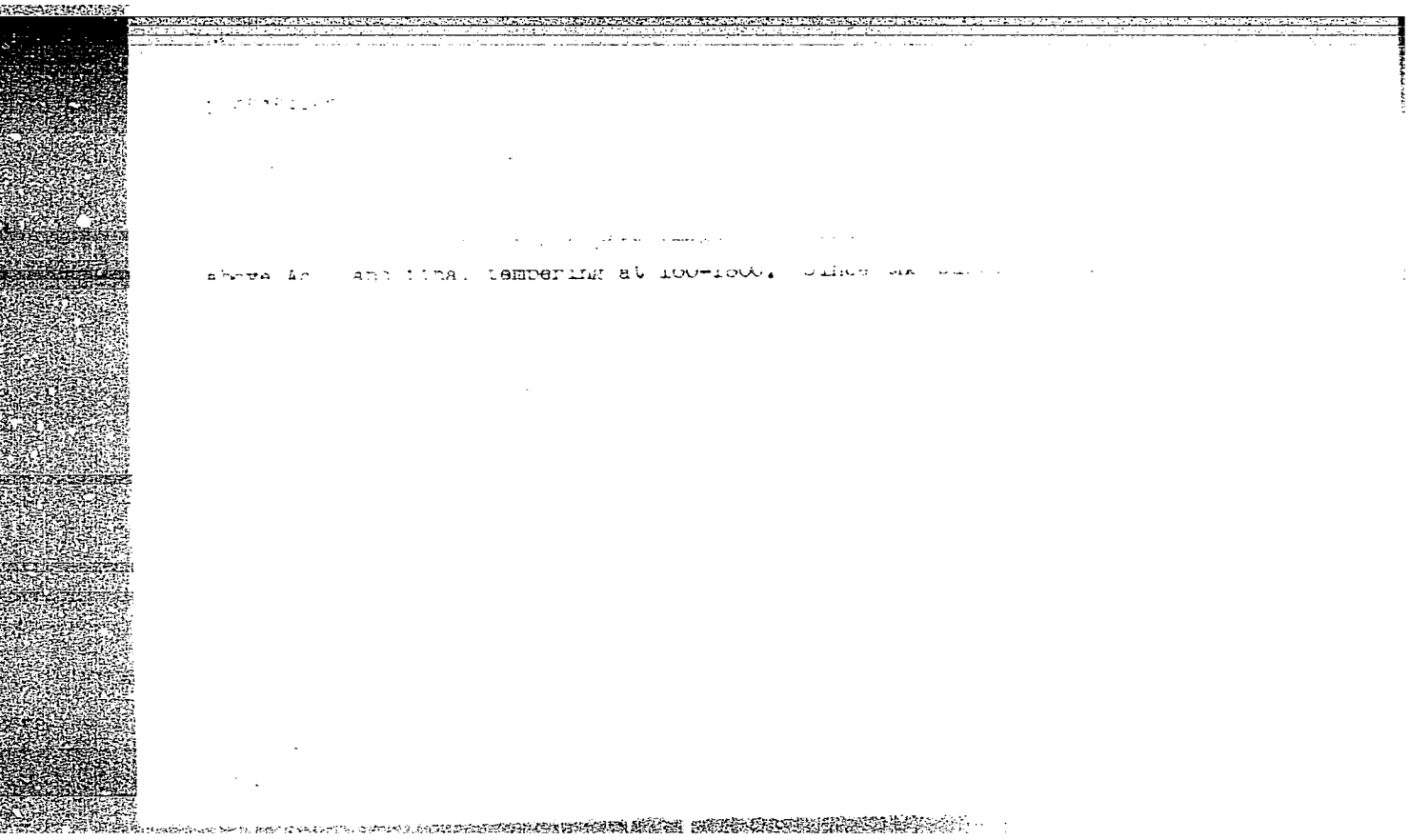
Card 3/3

BERNSHTEYN, M.L.; YELAGINA, L.A.; FATKULLINA, L.P.; SEMENOVA, N.M.

Effect of high temperature thermomechanical treatment on the fine structure of titanium alloys. Metalloved. i term. obr. met. no.5:35-38 My '65. (MIRA 18:7)

9Kh steel

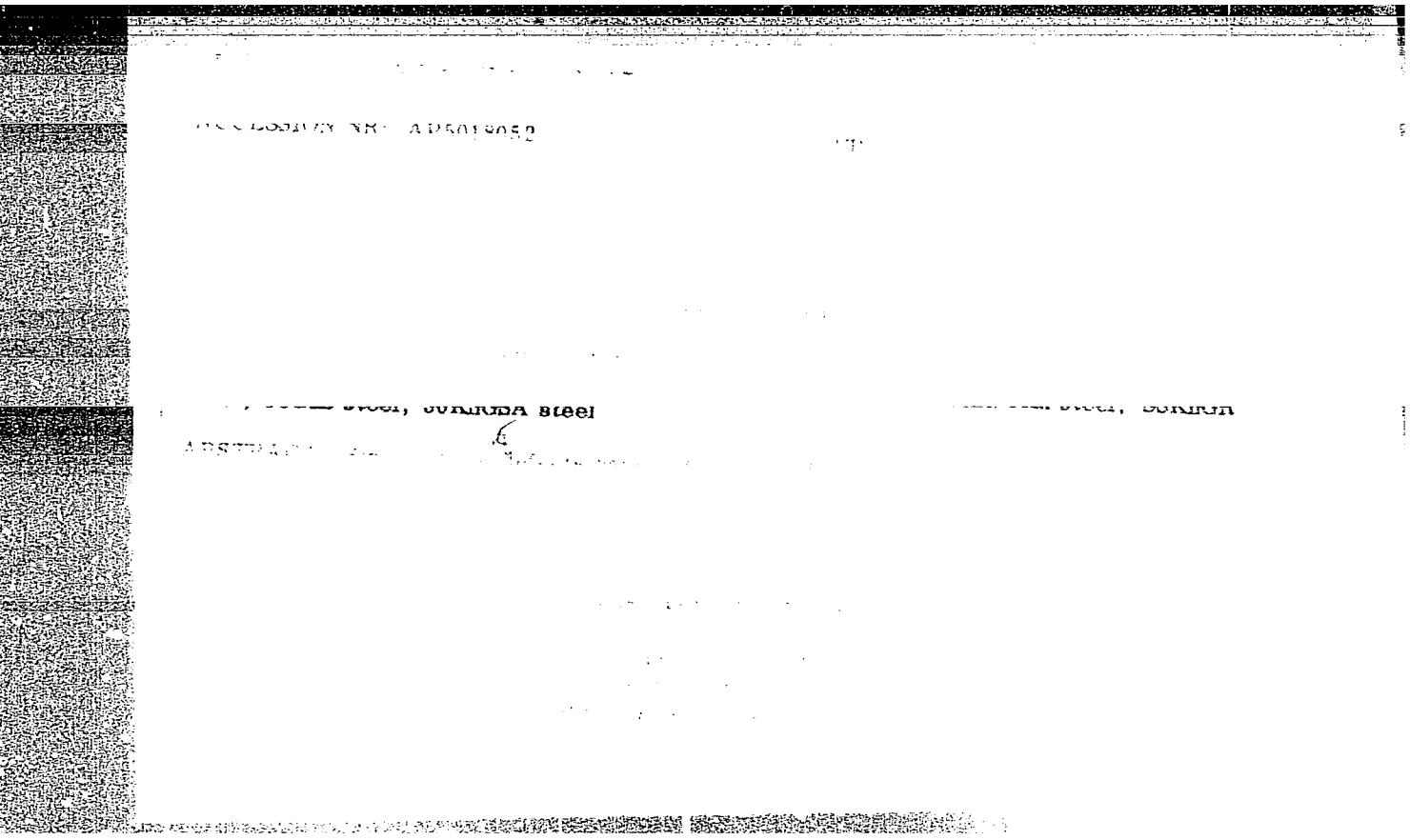
at a rate of deformation of 180 mm/min. After surface treatment, the specimens



BERNSHTEYN, M.L.; GRANIK, G.I.; DOLZHANSKIY, P.R.

Effect of magnetic fields on phase transformations in nickel steel. Fiz. met. i metalloved. 19 no.6:882-890 Je '65. (MIRA 18:7)

1. Moskovskiy institut stali i splavov.



L [illegible]

ACCESSION NR: AP[illegible]

conditions; 5) the changes in the mechanical properties of [illegible]
tubes as a function of [illegible]

L 14420-66 EWT(m)/EWA(d)/T/EWP(t)/EWP(k)/EWP(z)/EWP(b) IJP(c) MJW/JD/HW/JG

ACC NR: AP6002120 SOURCE CODE: UR/0369/65/001/006/0701/0706

AUTHOR: Bernshteyn, M. L.; Kalyagina, G. P.; Venzhega, A. S.; Belkin, M. Ya.; Ryabova, L. A.

ORG: Moscow Institute of Steel and Alloys (Moskovskiy institut stali i splavov)

TITLE: High-temperature thermomechanical surface treatment (with 9 Kh steel as example)

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 1, no. 6, 1965, 701-706

TOPIC TAGS: steel, surface hardening, metal heat treatment, mechanical heat treatment

ABSTRACT: The paper gives the results of a study and adoption in industry of a new method of hardening the surface layers of cold rolls, the high-temperature thermomechanical surface treatment (HTMST). In experiments with rolls of 9Kh steel, the greatest increase in the contact strength of 9Kh steel rolls as compared to ordinary hardening treatment with high-frequency currents and low tempering is provided by HTMST involving an austenizing temperature of 900-950C, a draft pressure of 64 dkN, a longitudinal feed of 180 mm/min, and a rotation velocity of 720 rpm. After this treatment, the contact strength in the zone of

Card 1/2

L 14420-66

ACC NR: AP6002120

2

limited life increased from 4.1—5.4 to 13.0—14.8 million cycles (in some samples, up to 50—55 million cycles). The life of the working rolls of a twelve-roll mill increased by a factor of over 2. Metallographic studies and microhardness measurements following the HTMST showed the presence of a markedly hardened surface layer characterized by a high etchability. HTMST results in a refinement of carbide particles, an increased alloying with chromium, and causes a certain orientation to appear in the separation of these particles. Orig. art. has: 3 figures and 2 tables.

SUB CODE: 11 / SUBM DATE: 11Mar65 / ORIG REF: 001

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Card 2/2

L 12144-66 EWT(m)/EWA(d)/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c) MJW/JD/HW

ACC NR: AP6000595 SOURCE CODE: UR/0133/65/000/012/1108/1110

AUTHOR: Bernshteyn, M. L.; Dregan, N.; Korobochkin, I. Yu.; Vil'yams, O. S.; Kurilenko, V. Kh.; Koval'chuk, T. M.

ORG:

TITLE: Possibilities and prospects for the combined hot and cold working of drilling-rig pipe

SOURCE: Stal', no. 12, 1965, 1108-1110

TOPIC TAGS: pipe, steel, heat treatment, cold working, work hardening, carbon steel low alloy steel/ D steel, 36G2S steel

ABSTRACT: It is shown that the high-temperature thermomechanical treatment (combined cold and hot working) of pipe manufactured from D and 36G2S steels (0.44% C, 1.10% Mn, 0.32% Si and 0.38% C, 1.65% Mn, 0.58% Si, respectively), as based on water quenching from 840-850°C immediately after rolling, followed by tempering for 1 hr at temperatures of from 100 to 600°C, markedly increases the mechanical properties of the pipe (following low-temperature tempering, σ_B = 220-240 kg/mm^2 at δ = 7-8%, and following high-temperature tempering σ_B = 95-115 kg/mm^2 at δ = 11-14%) This effect is still further enhanced when the treatment is followed by tempering at 500°C for 1 hr, high-speed heating to 850°C for 3 min, water quenching, and final low-temperature temper-

Card 1/2 UDC: 621.774.658.562

L 12144-66

ACC NR: AP6000595

ing, which results in the work-hardening of the metal. Experiments with accelerated compressed-air cooling of the pipe immediately after rolling show that this magnifies even further the effect of preceding work hardening as compared with ordinary normalization, as was found by subjecting pipe rolled from D and 36G2S steels to cooling with high-pressure compressed air immediately after rolling, with subsequent tempering at from 400 to 600°C for 1.5 hr. This opens broad vistas for replacing alloy steels with carbon and low-alloy steels. Orig. art. has:5 tables, 1 figure.

SUB CODE: 11, 13/ SUBM DATE: none/ ORIG REF: 004/ OTH REF: 000

Card 2/2

BERNSHTEYN, M.L.; CHEREPANOVA, G.I.

Feasibility of increasing the strength and heat resistance of Kh 8-type steels by thermomechanical treatment. Fiz.-khim. mekh. mat. 1 no.1:60-66 '65. (MIRA 19:1)

1. Institut stali i splavov, Moskva. Submitted September 28, 1964.

L 15711-66 EWT(m)/EWA(d)/T/EWP(t)/EWP(k)/EWP(z)/EWP(b) MJW/JD/HW

ACC NR: AP6003297 (N) SOURCE CODE: UR/0129/66/000/001/0002/0005

AUTHOR: Kagan, D. Ya; Bernshteyn, M. L.

ORG: none

TITLE: Hardening treatment for high-temperature alloys

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 1, 1966, 2-5

TOPIC TAGS: heat resistant alloy, metal hardening, crystal structure, metal heat treatment, metal aging, plastic deformation / KhN77TYuR alloy, KhN70MVTYuB alloy

ABSTRACT: The strength of metals can be effectively increased by inducing a pile-up of defects and creating a definite fine crystalline structure by means of heat treatment combined with plastic deformation. On applying various combinations of this kind in order to harden KhN77TYuR and KhN70MVTYuB heat-resistant the authors found the optimal combination to be as follows: for KhN77TYuR alloy -- heating to 1120°C for 30 min + 25-30% deformation (with ending of deformation at 1050-1030°C) + air cooling; for KhN70MVTYuB alloy -- heating to 1150°C for 60 min + 25-30% deformation (with ending of deformation at 1050-1070°C) + air cooling. Both alloys were aged for 16 hr (at 700 and 800°C, respectively). This treatment increases the plasticity and reduces the notch sensitivity of metal, and it is simpler, faster and more effective than the conventional thermomechanical treatment consisting in quenching, aging and prolonged

Card 1/2

UDC: 539.374:621-785:669.14.018.45

L 15711-66
ACC NR: AP6003297

work hardening which, moreover, causes some embrittlement of the material. Orig. art. has: 4 figures, 2 tables.

SUB CODE: 11, 13, 20/ SUBM DATE: none/ ORIG REF: 000/ OTH REF: 000

Card 2/2

L 02982-67 EWT(m)/T/EWP(t)/ETI/EWP(k) IJP(c) JD/HW

ACC NR: AP6032457 SOURCE CODE: UR/0129/66/000/009/0039/0042

48
B

AUTHOR: Dregan, N.; Bernshteyn, M. L.

ORG: Moscow Institute of Steel and Alloys (Moskovskiy institut stali i splavov)

TITLE: Preliminary thermomechanical treatment of tubes

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 9, 1966, 39-42

TOPIC TAGS: alloy steel, steel tube, tube thermomechanical treatment, low temperature thermomechanical property, 30KhGSA steel, 20A steel

ABSTRACT: Hot-rolled 30KhGSA and 20A steel tubes, 57 mm in diameter with a wall thickness of 3.5—3.75 mm, were subjected to low temperature thermomechanical treatment (LTMT), i.e., cold rolled to 45 mm diameter and 1.6 mm wall thickness (30KhGSA), or 30 mm diameter and 2 mm wall thickness (20A), annealed in salt bath at 880C for 2—30 min, oil or water quenched and then tempered at 100—600C. The LTMT significantly increased the tensile and yield strength of the 30KhGSA tubes without a significant reduction of ductility (see Fig. 1). Additional tests revealed that the austenite grain size or shape has little or no effect on strengthening in LTMT. The effect of

Card 1/2 UDC: 539.374.621.785.622.245

L 02982-67

ACC NR: AP6032457

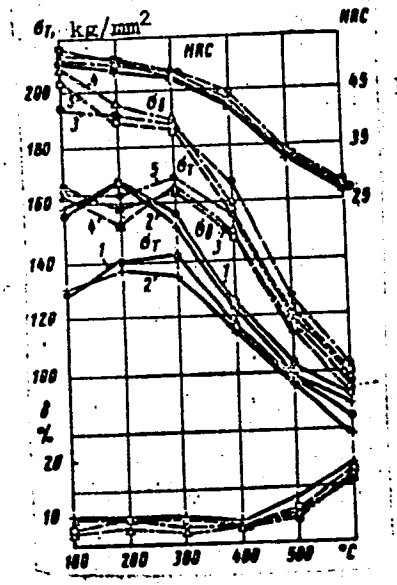

Fig. 1. Tempering temperature dependence of mechanical properties (σ_B - tensile strength; σ_T - yield strength; δ - elongation)

1 - Annealed at 740C, furnace cooled, annealed at 880C for 2 min, and oil quenched; 2 - annealed at 860C, at 880C for 2 min and oil quenched; 3, 4, 5 - annealed at 880C for 2, 10 or 30 min and oil quenched.

LTMT on 20A tubes was less pronounced because of a lower carbon content. Orig. art. has: 2 figures and 3 tables.

SUB CODE: 11, 13/ SUBM DATE: none/ ORIG REF: 007/ OTH REF: 002/ ATD PRESS: 5099

Card 2/2 egk

L 47302-66 EWT(m)/EWP(t)/ETI/EWP(k) IJP(c) JD/HW/JG

ACC NR: AP6032054 (N) SOURCE CODE: UR/0148/66/000/009/0153/0157

60
59
B

AUTHOR: Bernshteyn, M. L.; Shtoydten, V.

ORG: Institute of Steels and Alloys, Moscow (Moskovskiy institut stali i splavov)

TITLE: Thermomechanical treatment of EI-612 type heat-resistant steel

SOURCE: IVUZ. Chernaya metallurgiya, no. 9, 1966, 153-157

TOPIC TAGS: nickel chromium alloy, manganese containing alloy, tungsten containing alloy, molybdenum containing alloy, titanium containing alloy, heat resistant alloy, alloy thermomechanical treatment, low temperature thermomechanical treatment , alloy property/EI-612 alloy

ABSTRACT: Experiments have been made to increase the strength of Kh15N35VT (EI-612) type alloy by increasing the chromium content up to 20%, additional alloying with molybdenum in amounts of 2, 4 or 6%, and thermomechanical treatment. Steel specimens annealed at 1180C for 2 hr and water quenched were subjected to low-temperature thermomechanical treatment (LTMT), i.e., either cold drawn with 5, 50 or 75% reduction or rolled at 600C with 50% reduction, in both cases followed by aging at 760C for 25 hr or at 600C for 100 hr. LTMT increased significantly the strength of alloys. The alloy with 2% molybdenum, drawn with 50% reduction, had a room-temperature tensile strength of 105 kg/mm^2 and a yield strength of 81.6 kg/mm^2 compared to 84.5 and 49 kg/mm^2, respectively, for conventionally heat-treated specimens. LTMT, however,

Card 1/2 UDC: 669.14.018.45:621.785.53

L 47302-66

ACC NR: AP6032054

reduced the elongation and reduction of area to 14 and 28% compared to 30 and 42% for conventionally treated specimens. In tests at 700C, the difference became insignificant. The reduction of area of specimens rolled at 600C and aged at 600C for 100 hr was 55.6%, much higher in comparison to other heat treatment processes. Both types of LTMT lowered impact strength to 5.7 kg/cm^2 at 20 or 700C compared to 23.3 kgm/cm^2 in conventionally heat-treated specimens. LTMT greatly improved the heat resistance. Alloy containing 6% molybdenum, rolled at 600C and aged at 760C for 25 hr, had at 700C under a stress of 25 kg/mm^2 a rupture life of 1200 hr compared to 179 hr for conventionally treated alloy. Alloy with 4% molybdenum, cold-drawn with 50% reduction and tested at 700C under a stress of 20 kg/mm^2, failed after 5000 hr, compared to 1700 hr for conventionally treated alloy. Orig. art. has: 4 figures and 2 tables. [AZ]

SUB CODE: 11, 13/ SUBM DATE: 07Aug65/ ORIG REF: 002/ ATD PRESS: 5094

Card 2/2 afs

L 07389-67 EWT(m)/EWP(w)/EWP(k)/EWP(t)/ETI IJP(c) JD/HW
ACC NR: AP6027741 SOURCE CODE: UR/0370/66/000/004/0064/0067

AUTHOR: Kal'ner, V. D. (Moscow); Kidin, I. N. (Moscow); Bernshteyn, M. L. (Moscow)

ORG: None

TITLE: Electrical ausforming of spring steel

SOURCE: AN SSSR. Izvestiya. Metally, no. 4, 1966, 64-67

TOPIC TAGS: metal ausforming, spring steel, mechanical heat treatment, metal deformation, ductility

ABSTRACT: The authors study the possibility of using high-speed electrical heating in ausforming of 55KhGR spring steel. The contact method was used for heating to 950°C before deformation at rates of 15, 30, 45 and 120°/sec. The back-up roll on the mill was used as one of the contacts so that deformation was done practically at the heating temperature. The blanks subjected to reduction measured 120×15 mm with thicknesses from 3 to 5 mm depending on the degree of deformation (15-38%). Immediately after rolling, the workpiece went into a quenching vat with oil or onto a cold metal plate (for air-quenching) and was then tempered at 250°C for one hour. The mechanical properties were studied on flat tensile specimens with working dimensions of 30×2×4 mm and compared with similar data for ausforming in a conventional electric furnace (heating temperature 950°C with holding for 5 minutes). An increase in the heating rate

UDC: 539.4.015/019

Card 1/2

L 07389-67
ACC NR: AP6027741

results in additional improvement in mechanical properties with reductions of 15-30%. For small deformation or none at all, high-speed electric heating produced a slight increase in tensile strength although brittle fracture was observed with an elongation of less than 2%. No further increase in tensile strength was observed with deformation of more than 25% and there was even a slight reduction in tensile strength at a heating rate of 120 deg/sec while specimens subjected to conventional ausforming showed a continuous increase in strength at deformations of 37-40%. Strength characteristics are practically identical for both types of ausforming at these deformations. Electrical ausforming improves ductility with elongation reaching 9% as against 6.5% for conventional ausforming with corresponding figures of 35-40% against 18-20% for constriction. Improvement in the properties of 55KhGR spring steel with conventional ausforming is reached at a reduction of 25-30%, while this "threshold" deformation is much more pronounced in electrical ausforming and is reached at a reduction of approximately 15-20%. The maximum difference between strength and ductility produced by electrical and conventional ausforming is also observed at reductions of 15-20%. Orig. art. has: 4 figures, 1 table.

SUB CODE: 11/ SUBM DATE: 27Nov64/ ORIG REF: 004

Card 2/2 LS

ACC NR: AP6036393 (A) SOURCE CODE: UR/0032/66/032/011/1405/1406

AUTHOR: Bernshteyn, M. L.; Marko, I.

ORG: Moscow Institute of Steel and Alloys (Moskovskiy institut stali i splavov)

TITLE: Characteristics of stress-strain diagrams of superstrength steel with strain-hardened martensite

SOURCE: Zavodskaya laboratoriya, v. 32, no. 11, 1966, 1405-1406

TOPIC TAGS: superstrength steel, steel thermomechanical treatment, stress strain diagram, strain hardening/50KhFA steel

ABSTRACT: Specimens of 50KhFA steel were subjected to a combined thermomechanical treatment (CTMT) which consisted of high-temperature thermomechanical treatment followed by quenching to obtain a martensitic structure and tempering at 200C for 2 hr, and low temperature thermomechanical treatment (LTMT) which consisted of cold deformation with 1—3% reduction followed by aging at 100C for 40 hr. The diagrams of the conventionally treated specimens did not show a distinct yield point. The thermomechanically treated specimens, however, show very distinct upper and lower yield points (see Fig. 1). The difference between these two points increased with increasing reductions in LTMT, and in specimens deformed with 3% reduction, amounted to 55 kg/mm^2. It is assumed that aging of martensite whose matrix

Card 1/2 UDC: 620.172.2

ACC NR: AP6036393

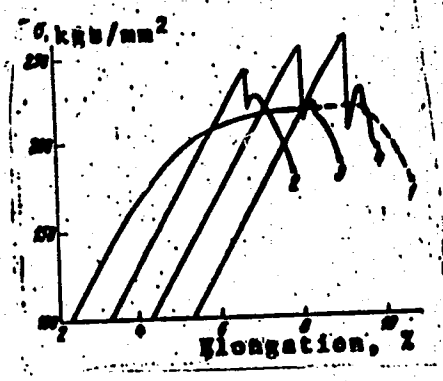

Fig. 1. The effect of reduction in martensite deformation on the shape of the stress-strain curve of 50KhFA steel

1 - Conventionally hardened and tempered at 200C; 2 - same with 1% reduction aged at 100C for 40 hr; 3 - same with 2% reduction; 4 - same with 3% reduction.

was distorted by cold deformation plays a significant part in strengthening. The second maximum on the stress-strain curve corresponds to the intensive reduction of area and is brought about by the strain aging occuring during the test. Orig. art. has: 3 figures.

SUB CODE: 11, 13/ SUBM DATE: none/ ORIG REF: 002/ OTH REF: 002/
ATD PRESS: 5107

Card 2/2

L 08687-67 EWP(k)/EWT(m)/EWP(t)/ETI IJP(c) JD/HW
ACC NR: AP6031718 (A) SOURCE CODE: UR/0370/66/000/005/0091/0097

AUTHOR: Bernshteyn, M. L. (Moscow); Zlochevskaya, I. I. (Moscow)

ORG: none

TITLE: Dislocation structure of Nimonic-type alloy after thermomechanical treatment performed under different conditions

SOURCE: AN SSSR. Izvestiya. Metally, no. 5, 1966, 91-97

TOPIC TAGS: nickel chromium alloy, alloy thermomechanical treatment, CRYSTAL DISLOCATION, ANNEALING, METAL ROLLING, nickel chromium alloy structure, dislocation structure, KhN77TYuR alloy

ABSTRACT: A series of specimens of KhN77TYuR Nimonic-type alloy were subjected to two variants of thermomechanic treatment: (1) annealing at 1080C for 8 hr, water quenching, cold rolling, and aging at 700C for 16 hr or (2) annealing, hot rolling, water quenching, and aging. In specimens treated according to variant 2, the dislocation density increased with increased reduction. At reductions of about 50%, a redistribution of dislocations took place, with a random accumulation of dislocations within cells 0.1—0.2 micron in diameter. No selective precipitation of γ'-phase on the dislocations during aging was observed. In specimens cold rolled with reductions up to 20%, the aging promotes a polygonization accompanied by considerable annihilation of dislocations.

Card 1/2 UDC: 669.245

L 08687-67
ACC NR: AP6031718

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However, the cellular structure, formed in cold rolling with 50% reduction, remains stable during aging. Also, in hot rolling simultaneously with an increase in dislocations density, a redistribution of dislocation and the formation of a structure with stable subboundaries occurred. Within polygon and recrystallized grains, the dislocation structure remains unchanged. The structure, formed by high-temperature deformation, is not affected by subsequent aging at 700C. Orig. art. has: 4 figures.

SUB CODE: 13, 11/ SUBM DATE: 05Jul65/ ORIG REF: 003/ OTH REF: 002

Card 2/2 nlc

L 08426-67 EWT(m)/EWP(w)/EWP(k)/EWP(t)/ETI IJP(c) JD/HW/JG/GD
ACC NR: AT6034438 (N) SOURCE CODE: UR/0000/66/000/000/0084/0086

AUTHOR: Demina, E. L.; Bernshteyn, M. L. 36, B+1

ORG: none

TITLE: Effect of polygonization on the heat resistance characteristics of molybdenum 21

SOURCE: AN SSSR. Institut metallurgii. Svoystva i primeneniye zharoprochnykh splavov (Properties and application of heat resistant alloys). Moscow, Izd-vo Nauka, 1966, 84-86

TOPIC TAGS: molybdenum, ~~molybdenum mechanothermal~~ metal heat treatment, ~~molybdenum~~ polygonization, ~~polycrystal molybdenum property~~ metal property

ABSTRACT: Specimens of sintered-molybdenum wire, 1.00 mm in diameter, were drawn at 300 or 1150C with 5, 9 or 13% reduction, vacuum annealed at 1150C for 1 hr, and subjected to stress-rupture tests at 900C under a stress of 20 kg/mm^2. The rupture life was found to increase with increasing reductions. For instance, specimens drawn at 1150C with 5% reduction and then annealed at this temperature for 1 hr withstood 95 min, while specimens reduced by 9 or 13% and annealed withstood 240 or 585 min respectively. The annealing of deformed molybdenum stimulates the formation of a polygonized structure which has a high creep resist-

Card 1/2

L 08426-67
ACC NR: AT6034438 O

ance. However, with drawing at low temperature or with lower reduction, the polygonization is not completed after 1 hr at 1150C. Only drawing with 13% reduction at 1150C, followed ay annealing at the same temperature produces a complete polygonization and the highest increase of rupture life. This mechanothermal treatment, which creates a polygonized structure, also substantially improves the ductility. For instance, the maximum elongation of molybdenum deformed at 1150C with 9% reduction and annealed at 1150C is 24% compared with 8% for molybdenum deformed at 300C and tested without being annealed. Specimens deformed at 300C with 5 and even 13% reduction also have a lower ductility. Orig. art. has: 2 figures.

SUB CODE: 13, 11/ SUBM DATE: 10Jun66/ ATD PRESS: 5103

Card 2/2 LS

ACC NR: AP6032199 SOURCE CODE: UR/0133/66/000/010/0944/0946

AUTHOR: Dregan, N.; Bernshteyn, M. L.

ORG: Moscow Institute of Steel and Alloys (Moskovskiy institut stali i splavov)

TITLE: High temperature thermomechanical treatment of 38KhNM alloy steel drill pipes

SOURCE: Stal', no. 10, 1966, 944-946

TOPIC TAGS: PIPE, HOT ROLLING, alloy steel, high temperature thermomechanical treatment, drill pipe, metal property /38KhNM alloy steel

ABSTRACT: Hot-rolled 38KhNM drill pipes were subjected to high temperature thermomechanical treatment (HTMT) and water quenched immediately after rolling. Pipes which were tempered at 500—600C or at 200C after HTMT had a tensile strength 125—132 and 220—235 kg/mm^2, a yield strength of 118—123 and 185—200 kg/mm^2, an elongation of 10% (in both cases), a reduction of area of 52—55% and 40—50%, and a notch toughness of 9.5—11.5 and 7.5—10 kgm/cm^2, respectively. Corresponding figures for conventionally treated (annealed at 860—900C and air cooled) pipes were 85 kg/mm^2, 62 kg/mm^2, 17%, 53%, and 7.5 mkg/cm^2. Pipes which were tempered at 500C after HTMT then reheated in a molten salt bath to 850C quenched, and tempered at 600C, still had a tensile strength of 100 kg/mm^2, a yield strength of 82 kg/mm^2, and elongation of 13.5%, a reduction of area of 58%, and a notch toughness of 10.4 kg/cm^2. Orig. art. has: 2 figures.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 002

Card 1/1 UDC: 621.785:621.774.3

ACC NR: AP6035960 SOURCE CODE: UR/0129/66/000/010/0069/0070

AUTHOR: Bernshteyn, M. L.; Zuyeva, O. M.

ORG: Moscow Institute of Steel and Alloys (Moskovskiy institut stali i splavov)

TITLE: Recrystallization of manganese and nickel steels in high-temperature thermomechanical treatment

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 10, 1966, 69-70

TOPIC TAGS: metal recrystallization, ~~metals~~ recrystallization temperature, steel thermomechanical treatment, high temperature thermomechanical treatment, manganese steel, nickel steel, MECHANICAL HEAT TREATMENT

ABSTRACT: The effect of manganese (2, 4, 6 and 8%) and nickel (4, 8, 12 and 16%) on the recrystallization of steels containing 0.01—0.8% carbon during high temperature thermomechanical treatment (HTMT) has been investigated. Prior to HTMT, manganese steel specimens were fully annealed at 800—850C for 1.5—2 hr, and nickel steel specimens were tempered at 500—550C for 7—10 hr. HTMT consisted of heating to a temperature 70—90C above the Ac_3 point, holding for 20 min, rolling with a reduction of 50% and subsequent water quenching. It was found that

Card 1/2 UDC: 669.24'74:621.977:620.186.5

ACC NR: AP6035960

manganese and nickel delay the recrystallization, particularly in steels with a very low carbon content. Increased carbon content contributes to the development of recrystallization. Manganese steels containing 0.01%C and 6—8% Mn may be subjected to HTMT, since these steel exhibit a considerable delay of at least 10 sec in recrystallization with 50% deformation. Orig. art. has: 2 figures.

SUB CODE: 13, 11/ SUBM DATE: none/ ORIG REF: 002

Card 2/2

ACC NR: AP6035960 SOURCE CODE: UR/0129/66/000/010/0069/0070

AUTHOR: Bernshteyn, M. L.; Zuyeva, O. M.

ORG: Moscow Institute of Steel and Alloys (Moskovskiy institut stali i splavov)

TITLE: Recrystallization of manganese and nickel steels in high-temperature thermomechanical treatment

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 10, 1966, 69-70

TOPIC TAGS: metal recrystallization, recrystallization temperature, steel thermomechanical treatment, high temperature thermomechanical treatment, manganese steel, nickel steel, MECHANICAL HEAT TREATMENT

ABSTRACT: The effect of manganese (2, 4, 6 and 8%) and nickel (4, 8, 12 and 16%) on the recrystallization of steels containing 0.01—0.8% carbon during high temperature thermomechanical treatment (HTMT) has been investigated. Prior to HTMT, manganese steel specimens were fully annealed at 800—850C for 1.5—2 hr, and nickel steel specimens were tempered at 500—550C for 7—10 hr. HTMT consisted of heating to a temperature 70—90C above the Ac_3 point, holding for 20 min, rolling with a reduction of 50% and subsequent water quenching. It was found that

Card 1/2 UDC: 669.24'74:621.977:620.186.5

ACC NR: AP6035960

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SUB CODE: 13, 11/ SUBM DATE: none/ ORIG REF: 002

Card 2/2

ACC NR: AP7005758 SOURCE CODE: UR/0126/67/023/001/0158/0161

AUTHOR: Bernshteyn, M. L.; Granik, G. I.; Zaymovskiy, V. A.

ORG: Moscow Institute of Steel and Alloys (Moskovskiy institut stali i splavov)

TITLE: The effect of cyclic thermomagnetic treatment near the Curie point on the ductility of iron

SOURCE: Fizika metallov i metallovedeniye, v. 23, no. 1, 1967, 158-161

TOPIC TAGS: alloy heat treatment, iron, alloy steel, ductility, thermomagnetic effect, Curie point, iron property, steel property/Armco iron, 40Kh steel

ABSTRACT: Armco iron specimens were heated for five cycles, each at 750 for 10 min and 790°C for 10 min; after which the temperature was rapidly raised to 920°C where the specimens were held for 3 minutes and then quenched in water. The thermal treatment was conducted in a constant magnetic field of 10,000 oersteds. It was found that magnetic treatment lowered the nil-ductility temperature of the Armco iron specimens. For instance, at - 96°C the notch toughness was increased from 3.5 kgm/cm^2 (cyclic heat treatment without magnetic field) to 11 kgm/cm^2 (cyclic thermomagnetic treatment), and at -75°C it was increased from 6.5 to 19 kgm/cm^2, respectively. Thermal treatment of 40Kh steel

Card 1/2 UDC: 539.4.016

ACC NR: AP7005758

specimens consisted of cyclic treating at 700—760°C, rapid heating to 860°C, where they were held for 7 min, and quenched in oil. Heat-treatment of these specimens was also conducted in a constant magnetic field of 10,000 oersteds. The specimens were tested for their mechanical properties. The results are shown in Fig. 1.

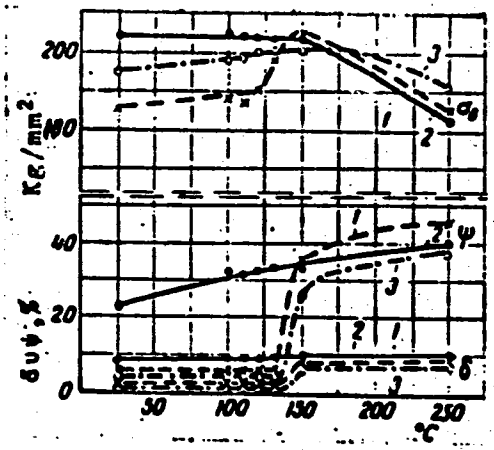

Fig. 1. The effect of cyclic thermomagnetic treatment on the mechanical properties of 40Kh steel:

1— Standard heat treatment;
2— cyclic thermomagnetic treatment;
3— cyclic heat treatment without magnetic field;
δ— elongation;
ψ— reduction of area;
σ_B— tensile strength.

Orig. art. has: 3 figures.
SUB CODE: 11,13/SUBM DATE: 29Dec66/ ORIG REF: 004/ OTH REF: 002 [TD]
Card 2/2

ACC NR: AP7005762 (A, N) SOURCE CODE: UR/0126/67/023/001/0176/0179

AUTHOR: Bernshteyn, M. L.; Goller, R.

ORG: Moscow Institute of Steel and Alloys (Moskovskiy institut stali i splavov)

TITLE: Effect of high-temperature thermomechanical treatment combined with cold deformation of martensite on the properties of machine steel

SOURCE: Fizika metallov i metallovedeniye, v. 23, no. 1, 1967, 176-179

TOPIC TAGS: machine steel, metal heat treatment, tempering, cold rolling / 40KhN4 type steel

ABSTRACT: This is a continuation of previous investigations of the Czechoslovak ChSN 16440 machine steel (0.44% C, 3.7% Ni, 0.84% Cr) of the 40KhN4 type (Bernshteyn, M. L., Dregan, N. Metallovedeniye i term. obrabotka metallov, 1965, no. 6, 3; Goller, R. Materialovy Sbornik, SVUMT, 1965) with the difference that it deals with combining the high-temperature thermomechanical treatment (HTTMT) of this steel (deformation at 920-950°C, followed by low-temperature tempering at 100, 150 and 200°C for 2 hr) with subsequent deformation of its martensitic structure by cold rolling. HTTMT enhances the plasticity of steel and hence prevents

Card 1/2 UDC: 669.14.018.295

ACC NR: AP7005762

to some extent premature brittle fracture compared with control (quenched) specimens. Findings: tempering at 100°C is ineffective; it is only following tempering at 150-200°C that the positive effect (increase in strength without detriment to the plasticity induced by HTTMT) of subsequent (following HTTMT) deformation of martensite manifests itself and the ultimate strength of 40KhN4 type steels rises to as much as 300 kg/mm^2. This favorable change in properties following HTTMT + cold deformation of martensite is due to the processes of dispersion hardening in the partially recrystallized structure of the material. Orig. art. has: 4 figures.

SUB CODE: 13, 20, 11/ SUBM DATE: 14Feb66/ ORG REF: 005/ OTH REF: 002

Card 2/2

SOV/137-58-11-22504D

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 11, p 95 (USSR)

AUTHOR: Bernshteyn, M. M.

TITLE: An Investigation of the Process of Cold Drawing of Small and Extra-small Precision Tubing of Stainless and Carbon Steel and of Alloys (Issledovaniye protsessa kholodnogo volocheniya pretsizionnykh trub malykh i sverkhmalykh razmerov iz nerzhaveyushchey i uglerodistoy stali i splavov)

PERIODICAL: Author's dissertation for the degree of Candidate of Technical Sciences, presented to the Vses. n.-i. trubn. in-t (All-Union Scientific Research Institute for Piping), Dnepropetrovsk, 1958

ABSTRACT: An equation is derived for determining change in wall thickness per pass in drawing (D) tubes (T) without mandrel. This formula shows that: 1) Change in wall thickness depends primarily upon the ratio of the initial thickness S_0 to the initial outside T diameter D_0, upon the reduction ratio E, and upon the coefficient of tension B; when the $S_0:D_0$ ratio is very small, the thickening of the wall is at a maximum; 3) when $\Delta S_0:S_0$ is zero, it is possible to find a $S_0:D_0$ critical ratio at which the wall thickness does not change.

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An Investigation of the Process of Cold Drawing (cont.)

It is experimentally established that the conditions of strength of the T cross section and the strength of the head in D without mandrel permit partial reductions of as much as 42-47%. In mandrel-less D of thin-walled and extra-thin-walled T, the degree of deformation of the T is limited by the stability of its profile. A formula is derived for determination of the maximum deformation, ϵ %, under these conditions, when $S:D \leq 0.04$. Diameter shrinkage rises with increase in the S:D ratio; the reduction ratio, μ, and the angle of inclination of the bell generatrix are determined by the formula derived. It is found that on multiple D of T without heat treatment, the value of σ_v rises in proportion to ϵ up to a given limit. A formula is derived for total reduction ratio, μ, which makes it possible to discover the required strength properties of T of Nr 1Kh18N9T steel in accordance with the terminal values of S_k and D_k. When T are drawn on a long mandrel (M), the forces of friction in the die and the M are different in direction. The forces of friction on the M facilitate D. It is experimentally established that when T is drawn on a long M, the maximum draft per pass with a copper-plated M surface is $\mu = 2.6$. When the M surface has been polished with emery cloth, $\mu = 2.75$-2.8; when the M surface has been worked with rough emery wheel, $\mu = 3.05$. Subsequent D of T without mandrel and with no prior heat treatment showed that they could be D to 4.1x0.45 mm.

Card 2/3

SOV/137-58-11-22504D

An Investigation of the Process of Cold Drawing (cont.)

ASSOCIATION: Vses. n.-i. trubn. in-t (All-Union Scientific Research Institute for Piping), Dnepropetrovsk

P. G.

Card 3/3

SOV/137-58-12-25246

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 12, p 172 (USSR)

AUTHORS: Borisov, S. I., Bernshteyn, M. M.

TITLE: Changes in the Mechanical Properties of 1Kh18N9T Stainless Steel in Relation to the Degree of Deformation During Cold Drawing (Izmeneniye mekhanicheskikh svoystv nerzhaveyushchey stali marki 1Kh18N9T ot stepeni deformatsii pri kholodnom volochenii)

PERIODICAL: Byul. nauchno-tekhn. inform. Vses. n.-i. trubnyy in-t, 1958, Nr 4, pp 62-70

ABSTRACT: An investigation was made of the effect of different procedures of cold drawing and intermediate heat treatment on the mechanical properties of 1Kh18N9T steel in the manufacture of capillary, thin-walled, and precision tubes. A batch of 10 x 1 mm hollow ingots was divided into six groups. Each group was drawn under different conditions with a view of determining the reduction operation after which heat treatment of the tubes should be terminated. Specimens were taken from each group after each reduction in order to determine their mechanical and technological characteristics, namely: σ_b, δ, the bending stress corresponding to the beginning of residual deformation, the bending

Card 1/2

Changes in the Mechanical Properties of 1Kh18N9T Stainless Steel (cont.)

moment, and the number of bendings. It was established that upon the cessation of heat treatment σ_b increases and attains its maximum after 7 - 10 reductions. At that point δ has a value of 2 - 2.5%, and further drawing of the tubes is feasible. With a lower value of δ the number of ruptures increases appreciably. Therefore, in the examined case of drawing of tubes with 0.6 - 1.5 mm outer diameter and walls 0.15 mm thick, the number of reductions without heat treatment should be limited to 7 - 10. On the basis of the findings of the work a diagram was construcied correlating that value of the draft μ which ensures the maximum strengthening of steel with the ratio of the wall thickness to the tube diameter, $\mu = 2.2\ S/D$. The formula affords a means for tentative calculation of pass sizing during the drawing of thin-wall tubes with cold-hardened surface without preliminary experiments.

M. Sh.

SOV/137-59-3-6962

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 3, p 290 (USSR)

AUTHORS: Borisov, S. I., Bernshteyn, M. M.

TITLE: Permissible Reductions During Drawing of Small Pipes Without a Mandrel Based on Considerations of Their Stability With Regard to Buckling in the Area of Contact (Depustimyye velichiny obzhatiy pri bezopravochnom volochenii trub malykh razmerov s uchetom ustoychivosti formy truby v ochage deformatsii)

PERIODICAL: Byul. nauchno-tekhn. inform. Vses. n.-i. trubnyy in-t, 1958, Nr 4-5, pp 71-76

ABSTRACT: In order to determine the effect of the strength of the exit cross section on the magnitude of maximum deformation (D) of small pipes (P), the process of drawing of P's with a wall thickness-diameter ratio (S/D·100%) of 4-30% was investigated at D's amounting to 47% per pass and at a velocity of drawing of 12 m/min. Graphs are presented showing the maximum D as a function of the ratio of wall thickness to the diameter (S/D ratio) of the P for various angles of cone-shaped entrance openings of the drawing dies. These graphs indicate that P's with ratios S/D·100%=4-10% and S/D·100%=10-18%

Permissible Reductions During Drawing of Small Pipes (cont.)

may be drawn at D's of 35-40% and up to 25%, respectively. Correspondingly, at S/D · 100%=20-25% and S/D · 100% > 25%, the D must not exceed 18 and 10%, respectively. The optimal angle α of the inclination of the fibers amounts to 12°. The results of experiments dealing with resistance to buckling of P's within the draw plate during drawing without a mandrel demonstrated that in the case of drawing of thin-walled P's the degree of D is limited by the specific value of the S/D ratio rather than by the absolute values of the wall thickness and the diameter of the P. Graphs showing the D as a function of the ratio of the wall thickness to the diameter of the P demonstrate that at ratios S/D · 100%=2%, S/D · 100%=3%, and S/D · 100%=3.5% the D must not exceed 10, 25, and 35%, respectively. At S/D · 100%=4% the maximum D is already governed by the strength characteristics of the gripped end or of the final cross section of the P. A reduction in the resistance to buckling of the P in the draw plate is significantly affected by the shape of the pointed end and by the extent of variations in wall thickness of the P. Experimental results demonstrated that, compared with the D of P's with standard ends, the critical D of P's having cupped ends was 1.3 - 1.5 times greater.

M. K.

Card 2/2

BERNSHTEYN, M.M., inzh.

Changes in wall thickness in drawing small-diameter tubes without mandrels. Obr. met. davl. no.5:179-197 '59. (MIRA 13:3)

1.Vsesoyuznyy nauchno-issledovatel'skiy trubnyy institut.
(Deep drawing (Metalwork))

S/137/61/000/005/023/060
A006/A106

AUTHOR: Bernshteyn, M.M.

TITLE: Changes in the wall thickness during mandrelles drawing of small-size pipes

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 5, 1961, 27, abstract 5D256 ("Tr. Ukr. n.-i. trubn. in-ta", 1959, no. 1 , 125 - 145)

TEXT: To check the derived theoretical dependences of metal deformation and the distribution of stresses in the draw plate, affecting changes in the wall thickness of pipes, tests were performed on a 15-ton mill at a drawing rate as high as 12 m/min. Cold-stretched seamless pipes of 1Х18Н9Т (1Kh18N9T), 30ХГСА (30KhGSA), Fe-Ni steel, Armco-Fe and Cu were subjected to drawing. Graphite mixed with automobile lubricating oil was used as a grease. Broaching of the pipes was performed at 10, 20 and 30% degrees of deformation. The draw plates were made of ШХ 15 (ShKh15) steel with R_c = 52 - 56. The theoretical and experimental results were used for the plotting of curves which show the changes in the thickness of pipe walls and whose results are in a satisfactory agreement. The magnitude of reduction is an important factor, affecting the

Card 1/2

Changes in the wall thickness ...

wall thickness of the pipes and the shifting of the critical correlation S/D where S is the wall thickness of the pipes and D is the external diameter of the pipe. Graphs are plotted showing the changes in the thickness of pipe walls and a formula is derived to determine the initial thickness of pipe walls at a 12° inclination angle of the generatrix of the draw plate aperture.

A. B.

[Abstracter's note: Complete translation]

Card 2/2

S/137/61/000/006/049/092
A006/A101

AUTHOR: Bernshteyn, M.M.

TITLE: Determining the drawing force and the mean value of deformation resistance

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 6, 1961, 36, abstract 6D295 ("Tr. Ukr. n.-i. trubn. in-ta", 1959, no. 1, 145 - 156)

TEXT: The author studied changes in the strength properties of metal along the deformation seat during mandrelless drawing of pipes and derived a formula for determining the mean value of deformation resistance. An empiric formula is suggested for calculating the magnitude of axial stress and pull force during the drawing of stainless and carbon steel pipes of 2.0 - 16 mm in diameter on a long mandrel and without a mandrel. Calculations made by the formulae suggested, yield values the most approaching actual data. For stainless steel the following formula was obtained: $\sigma_b \approx 0.82 R^B$.

V. Pospekhov

[Abstracter's note: Complete translation]

Card 1/1

S/123/61/000/011/015/034
A004/A101

AUTHORS: Pishik, N. S.; Vdovin, F. V.; Chukmasov, A. S.; Bernshteyn, M. M.

TITLE: Investigating centrifugal castings from 1Kh13N18V2B (1Kh13N18V2B) steel for the production of particularly thin-walled tubes

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 11, 1961, 66, abstract 11B511 (V sb. "Proiz-vo trub" no. 3, Khar'kov, 1960, 123-130)

TEXT: The authors investigated the microstructure of 1Kh13N18V1B steel specimens in the cast and heat-treated state. To check the quality of hot-rolled 89 x 6.5 mm tubes from this steel after heat treatment, their mechanical properties were determined, the macro- and microstructure analyzed and the intercrystalline corrosion tested. The obtained results confirm the possibility of producing especially thin-walled tubes (25 x 1 and 19.5 x 0.2 mm) from 1Kh13N18V1B steel blanks cast by the centrifugal method. There are 3 figures and 3 references.

N. Il'ina

[Abstracter's note: Complete translation]

Card 1/1

ACC NR: AR6035104 SOURCE CODE: UR/0137/66/000/008/D034/D034

AUTHOR: Alferova, N. S.; Bernshteyn, M. M.; Kurdyumova, G. G.

TITLE: Mastering of technology for making pipe from N36KhT steel

SOURCE: Ref. zh. Metallurgiya, Abs. 8D233

REF SOURCE: Sb. Proiz-vo trub. Vyp. 16. M., Metallurgiya, 1965, 41-45

TOPIC TAGS: pipe, pipe manufacture/N36KhT steel

ABSTRACT: A detailed analysis was made of the manufacturing technology of pipe from austenitic precipitation hardenable N36KhT steel. With this technology, more than 8000 m of various gages of pipe were produced from centrifugal hollow billets by cold rolling and drawing. The results of technological tests (flattening and expanding) indicated that the finished pipes meet all requirements. Comparison of their qualities with the qualities of cold-formed pipe produced from rolled drilled billets, indicated that the two types of pipe did not differ one from another in mechanical properties and impurity contentration of nonmetallic inclusions. Orig. art. has: 3 figures. L. Kochenova. [Translation of abstract] [NT]

SUB CODE: 11/

Card 1/1 UDC: 621.774.35

BERNSHTEYN, M.M.

New method of gluing soles without damaging the footwear
Leg. prom., no. 2, 1952

BERNSHTEYN, M.M.

Classification of hard leather
Leg. prom., no. 3, 1952

BERNSHTEYN, M.I.

Leather Industry and Trade

Measuring stiff leather by its weight and area, Leg. prom. 12 No. 4, 1952

Monthly List of Russian Accessions, Library of Congress, July 1952. Unclassified.

BERNSHTEYN,M.M.

Effett of hydrothermal actions on the firmness of glue strength
Leg. prom., 12, no. 6, 1952

BERNSHTEYN, M.M., kandidat tekhnicheskikh nauk; RAUZER, E.K., inzhener.

Introducing a new method of testing the durability of gluing soles and of statistical quality control. Leg.prom. 14 no.4:16-19 Ap '54. (MLRA 7:6)
(Boots and shoes) (Quality control)

BERNSHTEYN, M.M., kandidat tekhnicheskikh nauk.

Efficient method of cutting out stiff leather. Leg.prom.14 no.12:39-42 D '54. (MLRA 8:2)
(Shoe industry)

BERNSHTEYN, M.M., kandidat tekhnicheskikh nauk

Wear resistance of children's "parko" footwear. Leg.prom. 15 no.5: 29-32 My '55. (MLRA 8:7)
(Shoe industry)

BERNSHTEYN, M.M., kand.tekhn.nauk

Ways to increase the water resistance of Russian leather boots. Kozh.-obuv.prom. no.10:17-20 O '59. (MIRA 13:2)
(Boots and shoes)

BERNSHTEYN, M.M., kand.tekhn.nauk

New technolgoy for assembling and fastening two-layer counters as a factor for increasing the water resistance of Russian leather boots. Kozh.-obuv.prom. 2 no.5:19-23 My '60. (MIRA 13:9)

(Boots and shoes)

BERNSHTEYN, M.M.

Improving the waterproofing of boots made with Russian leather. Nauch.-issl.trudy TSNIKP no.32:103-122 '60. (MIRA 15:12)
(Boots and shoes) (Waterproofing)

GAMOVA-KAYUKOVA, N.I., kand.biol.nauk; SAMYSHKINA, M.A., starshiy nauchnyy sotrudnik; BERNSHTEYN, M.M., kand.tekhn.nauk; MUSATOVA, M.D., mladshiy nauchnyy sotrudnik; ABOLTINA, E.M., mladshiy nauchnyy sotrudnik; CHERKESOVA, E.I., mladshiy nauchnyy sotrudnik; IVANOVA, R.A., laborant.

Resistance to moulds of artificial leather, cardboard and tent-duck samples. Nauch.-issl. trudy VNIIPIK no.13:65-83 '62. (MIRA 18:1)

BERNSHTEYN, M.M.

Methods for the classification and determination of the basic parameters of stiff leather according to the established regularities of thickness distribution. Nauch.-issl. trudy TSNIKP no.33: 116-136 '63 (MIRA 18:1)

BERNSHTEYN, Maks Mikhaylovich; ZAYONCHKOVSKIY, A.D., prof., red.; KALASHNIKOVA, L.V., red.

[Manufacture of artificial leather in rolls on continuous production lines; a textbook] Proizvodstvo rulonnoi iskusstvennoi kozhi na potochnykh liniiakh; uchebnoe posobie. Moskva, Legkaia industriia, 1964. 42 p. (MIRA 18:5)

L 23826-66 EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(k) IJP(c) JD/HW

ACC NR: AP6013358 SOURCE CODE: UR/0370/66/000/002/0061/0068

AUTHOR: Zaymovskiy, V. A. (Moscow); Bernshteyn, M. L. (Moscow)

ORG: none

TITLE: High-temperature thermomechanical treatment of carbon steels

SOURCE: AN SSSR. Izvestiya. Metally, no. 2, 1966, 61-68

TOPIC TAGS: thermomechanical treatment, high temperature treatment, carbon steel treatment

ABSTRACT: Carbon steels St40 (0.44%C) and U9 (0.86%C) have been tested for the effect of high-temperature thermomechanical treatment (HTMT). Steel specimens 2—3 mm thick were austenitized, rolled with 15,25, and 50% reduction with rolling ending at 790—800C for U9 steel and 830—840C for St40, immediately water quenched, and then tempered at 100—500C. HTMT improved considerably the strength and ductility of both steels. St40 rolled with 50% reduction and tempered at 150C had a tensile strength of 190 kg/mm^2, an elongation of about 2%, and a reduction of area of 11%. The strength of U9 steel rolled with a reduction of 25% and tempered at 300C reached a maximum of 210 kg/mm^2 at an elongation of 5% and a reduction of area of 12%. Conventional hardening produced a measurable ductility (elongation of 1—5%) in U9 and St40 tempered at 350C or 300C, respectively, after which the steels have a respective tensile strength of 160 and 145 kg/mm^2. The results of these

Card 1/2 UDC: 669.14—157.9

L 23826-66

ACC NR: AP6013358

experiments were used as a basis for designing a unit for HTMT of St40 round bars 19 mm in diameter. The unit has already passed initial tests. The strength of bars is 2.5—3 times higher than those produced by conventional methods. Orig. art. has: 10 figures and 1 table. [WW]

SUB CODE: 11, 13/ SUBM DATE: none/ ATD PRESS: 4247

Card 2/2

BERNSHTEYN, M. S.

Bernshteyn, M. S. "The form of flow and the pressure of grain in silos", in the collection: Issled. raboty po inzh. konstruktsiyam, Issue 2, Moscow, 1948, p. 139-68, - Bibliog: 12 items.

SO: U-3261, 10 April 53, (Letopis 'Zhurnal 'nykh Statey, No. 11, 1949).

BERNSHTEYN, M.S., kandidat tekhnicheskikh nauk.

Approximate calculation of stability of elastic systems subjected to the joint action of several loads. Stroi.prom.34 no.12:31-33 D '56. (MLRA 10:2)
(Elasticity)

BERNSHTEYN, M.S., dots., kand. tekhn. nauk

Effect of initial stresses on the stability of plates. Nauch. trudy MLTI no.8:36-49 '58. (MIRA 13:3)
(Elastic plates and shells)

ZHEMOCHKIN, B.N., prof.; PASHCHEVSKIY, D.P., dotsent; BERNSHTEYN, M.S., dotsent; NIKIFOROV, S.N., prof.; TOCHISKIY, V.F., dotsent [deceased]; VILKOV, G.N., red.izd-va; RUDAKOVA, N.I., tekhn.red.

[Course in structural mechanics] Kurs stroitel'noi mekhaniki. Pod obshchei red. B.N.Zhemochkina. Izd.2. Moskva, Gos.izd-vo lit-ry po stroit., arkhit. i stroit.materialam. Pt.3. [Statics of structures] Statika sooruzhenii. 1959. 333 p. (MIRA 12:12)
(Structures, Theory of)