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S/032/61/027/005/005/017  
B119/B215

AUTHORS: Geller, Yu. A. and Fadyushina, M. N.

TITLE: Application of the magnetic-metallographic method for the determination of residual austenite in the steel structure

PERIODICAL: Zavodskaya laboratoriya, v. 27, no. 5, 1961, 562-565

TEXT: The magnetic-metallographic method is based upon the principle that in spontaneous magnetization colloidal magnetic particles evenly distributed on the polished steel surface are attracted by the ferromagnetic phases of the alloy. Non-magnetic phases (austenite, alloyed cementite, and carbides of alloying metals) no longer contain such particles and, thus, appear as light spots under the microscope (in contrast to the magnetic phases which are darkened by the particles covering them). The authors studied the possibility of applying this method for the determination of residual austenite in martensite-base steels and alloys (alloy instrument steels: X3F (KhVG), 9XC (9KhS); high speed steels: P9 (R9), P18 (R18)) after different heat treatment of specimens and finished instruments. The results

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Application of the ...

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obtained are in good agreement with those of magnetic and X-ray structural analysis. This method was also suited for determining very small amounts of austenite which could not be determined by the other two methods. It was also possible to eliminate differences in the results obtained by dilatometric and magnetic analyses. The method is especially suited for the determination of residual austenite in multiphase alloys and the continuous control of annealing high-speed steel immediately in instruments. There are 4 figures and 1 Soviet-bloc reference.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy instrumental'nyy  
institut (All-Union Scientific Research Institute of Instru-  
ments)

Card 2/2

GELLER, Yu.A., red.; LEVIT, Ye.I., red. izd-va; ISLENT'YEVA, P.G.,  
tekhn. red.

[Conference on metals and their heat treatment; materials] Me-  
tallovedenie i termicheskaia obrabotka; materialy. Moskva,  
Metallurgizdat, 1962. 350 p. (MIRA 15:7)

1. Konferentsiya po metallovedeniyu i termicheskoy obrabotke,  
Odessa, 1960.

(Physical metallurgy—Congresses)

31509

S/121/62/000/005/002/002  
D040/D113

18.11/VO

AUTHORS: Geller, Yu.A., and Semenova, I.N.

TITLE: Reducing the heat-treatment deformation of high-speed steel tools.

PERIODICAL: Stanki i instrument, no.5, 1962, 32-34

TEXT: The results of experiments with 100mm long and 5mm diam. P18 (R18) high-speed steel specimens are given. Heat treatment included heating to the usual 1275-1285°C, stepped quenching with brief holding at 550°C (as practiced at many Soviet plants) and holding at various lower temperatures, and quenching in a salt bath. Details of all treatment procedures are given. Deformation was judged by changes in the length of specimens due to martensitic transformation, for it was known from previous experience that the deformation of drills, taps, or reamers changes in direct proportion to changes in length. A slight increase in the content of

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D040/D113

Reducing the heat-treatment...

residual austenite (2-5%) in hardened specimens was sufficient to greatly reduce the deformation. Proper selection of quenching temperature proved effective, and it was shown that by lowering the holding temperature to 300°C the deformation was reduced. Holding at a still lower level, 250°C, in stepped quenching resulted in a smaller increase in the length of specimens (325 $\mu$ , or 30% lower than in continuous quenching). Incomplete isothermal quenching in a salt bath at 390°C and holding for 15 min reduced the increase in the length of the specimens to 259 $\mu$ . Conclusions: The practiced holding temperature of 550-450°C in step hardening should be reduced to 400-250°C or incomplete isothermal quenching with 15 min holding at 350-250°C used. The latter method has a better effect. Longer holding, up to 30 min, at 350-250°C is advised for very large tools of complex shape. There are 1 figure and 2 tables.

Card 2/2

X

SEMICHASTNAYA, A.V.; GELLER, Yu.A.

Steel for machine and press springs with high mechanical and technological properties. Izv. vys. ucheb. zav.; chern. met. 5 no.3:144-152 '62. (MIRA 15:5)

1. Moskovskiy stankoinstrumental'nyy institut.  
(Steel alloys--Testing) (Springs (Mechanism))

GELLER, Yu.A., doktor tekhn.nauk, prof.; BUSURINA, I.A., inzh.

Stability of residual austenite in hypereutectoid steel. Metalloved.  
i term. obr. met. no.6:39-43 Je '62. (MIRA 15:7)

1. Moskovskiy stankoinstrumental'nyy institut.  
(Steel--Metallography) (Eutectics)

GELLER, Yu.A.; SEMENOVA, I.N.

Reduction of deformations of high-speed-steel cutting tools  
by heat treatment. Stan.i instr. 33 no.5:32-34 My '62.  
(MIRA 15:5)

(Metal-cutting tools)  
(Tool steel—Heat treatment)



GELLER, Yu.A.; GOLUBEVA, Ye.S.

Improving the quality of 3KhB8 die steel by the selection of  
better conditions of heat treatment. Kuz.-shtam.proizv. 4  
no.8:l-4 Ag '62. (MIRA 15:8)  
(Tool steel—Heat treatment)

ALFEROVA, N.S., doktor tekhn. nauk; BERNISHTEYN, M.L., kand. tekhn. nauk; BLANTER, M.Ye., doktor tekhn. nauk; BOKSHEYN, S.Z., doktor tekhn.nauk; VINOGRAD, M.I., kand. tekhn.nauk; GAMOV, M.I., inzh.; GELLER, Yu.A., doktor tekhn. nauk; GOTLIB, L.I., kand. tekhn. nauk; GRDINA, Yu.V., doktor tekhn.nauk; GRIGOROVICH, V.K., kand. tekhn. nauk; GULYAYEV, B.B., doktor tekhn. nauk; DOVGALEVSKIY, Ya.M., kand. tekhn. nauk; DUDOVTSEV, P.A., kand. tekhn. nauk [deceased]; KIDIN, I.N., doktor tekhn. nauk; LEYKIN, I.M., kand. tekhn. nauk; LIVSHITS, B.G., doktor tekhn. nauk; LIVSHITS, L.S., kand.tekhn. nauk; L'VOV, M.A., kand. tekhn. nauk; MEYERSON, G.A., doktor tekhn. nauk; MINKEVICH, A.N., kand. tekhn. nauk; NATANSON, A.K., kand. tekhn. nauk; NAKHIMOV, A.M., inzh.; NAKHIMOV, D.M., kand. tekhn. nauk; OSTRIN, G.Ya., inzh.; PANASENKO, F.L., inzh.; SOLODIKHIN, A.G., kand. tekhn.nauk; KHMUSHIN, F.F., kand. tekhn. nauk; CHERNASHKIN, V.G., kand. tekhn. nauk; YUDIN, A.A., kand. fiz.-mat. nauk; YANKOVSKIY, V.M., kand. tekhn. nauk; RAKHSHTADT, A.G., red.; GORDON, L.M., red. izd-va; VAYNSHEYN, Ye.B., tekhn. red. (Continued on next card)

ALFEROVA, N.S.— (continued) Card 2.

[Metallography and the heat treatment of steel]Metallo-  
vedenie i termicheskaia obrabotka stali; spravochnik.  
Izd.2., perer. i dop. Pod red. M.L.Bernshteina i A.G.  
Rakhshtadta. Moskva, Metallurgizdat. Vol.2. 1962.  
1656 p. (MIRA 15:10)

(Steel--Metallography)  
(Steel--Heat treatment)

GELLER, Yu.A.; GALKINA, V.A.

Effect of tempering conditions on the quality of cutting tools  
made of high-speed steel. Stan.i instr. 33 no.12:31-33 D  
'62. (MIRA 16:1)  
(Metal-cutting tools--Testing)

L 11200-63 EWP(q)/EWT(m)/BDS--AFFTC/ASD--JD/JG  
ACCESSION NR: AP3001381 9/0148/63/000/005/0175/0184

AUTHOR: Kossovich, G. A.; Geller, Yu. A. 55

TITLE: Effect of molybdenum in high speed steel

SOURCE: IVUZ. Chernaya metallurgiya, no. 5, 1963, 175-184

TOPIC TAGS: molybdenum, properties of steel, high speed steel, phase analysis, tungsten, carbides, solid solution, mechanical properties, cutting tools

ABSTRACT: The effect of molybdenum content on the properties of high speed steel was studied. Phase analysis indicated a direct relationship between molybdenum content (at the expense of tungsten) and quantity of carbides passing into solid solution. Since molybdenum improves the distribution of carbides, the mechanical properties of the steel are likewise improved, and rough cutting tools using tungsten-molybdenum steel are superior to tungsten steel tools. Orig. art. has: 6 tables and 4 graphs.

ASSOCIATION: Moskovskiy stankoinstrumental'nyy institut (Moscow Machine Tool Institute)

SUBMITTED: 13Nov62

DATE ACQD: 01Jul63

ENCL: 00

SUB CODE: 00

NO REF SOV: 004

OTHER: 001

Card 1/1 1s/wmw

L 12784-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD  
ACCESSION NR: AP3002309 9/0182/63/000/006/0011/0014

AUTHOR: Geller, Yu. A.; Pavaras, A. E.

TITLE: Air-hardened die steels with a uniform carbide distribution, used in cold stamping

SOURCE: Kuznechno-shtampovochnoye proizvodstvo, no. 6, 1963, 11-14

TOPIC TAGS: die steel, carbide distribution, chemical composition, desired properties, hardness, heat resistance, strength, dimensional stability, workability

ABSTRACT: After criticizing the use of high-chromium steel for die manufacturing, the author states that die steels should fall into two types: those for work under light loads and those for work under heavy loads. Both types must show an even distribution of carbide, low hardening temperature, high hardness, and high resistance to warping. Dies of the second type must also be able to absorb heat without deteriorating. To possess all these properties the steels must be of a complex composition. Table 1 (Enclosure 1) shows the composition of two types of steel recommended by the author. Both of these metals show a uniform distribution of carbides; the first one hardens in the air at 820-840C, the second at 850-860C; they suffer little oxidation and scaling; neither one is sensitive to temperature changes; both show a hardness of 59-62 (Rockwell). These steels

L 12784-63

ACCESSION NR: AP3002309

also show low volumetric change, little warping and cracking in hardening. Steel <sup>2</sup>  
KhC3SVFM (4) stable in annealing and is heat resistant. The bending strength of  
this steel at hardness 57 is 240-250 kg/Sq mm; of steel 7KhG2VFM, it is 280-290  
kg/Sq mm. The American steel A5 is more sensitive to reheating, has lower strength,  
and is less stable at higher temperatures. The recommended steels are readily  
forged and machined. Orig. art. has: 4 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 12Jul63

ENCL: 01

SUB CODE: 00

NO REF SOV: 003

OTHER: 001

Card 2/3

GELLER, Yu.A.; MOISEYEV, V.F.; KOLTUNOV, A.A.

Heat conductivity of high-speed steels. Metalloved. i term. obr.  
met. no.9:2-7 S '63. (MIRA 16:10)

1. Moskovskiy stankoinstrumental'nyy institut.



GELLER, Yu.A.; PAVARAS, A.E.

Air-hardening die steels with a minimum of carbide heterogeneity for cold deformation. Kuz.-shtam. proizv. 5 no.6:11-14 Je '63. (MIRA 16:8)

MOISEYEV, V.F.; GELLER, Yu.A.

Effect of cobalt on the structure and properties of high-speed  
steel. Izv. vys. ucheb. zav.; Chern. met. 6 no.11:168-176  
'63, (MIRA 17:3)

1. Moskovskiy stanko-instrumental'nyy institut.

PAVARAS, A.E.; GELLER, Yu.A.

Determining the hardenability of steel being hardened in  
depth. Izv. vys. ucheb. zav.; Chern. met. 6 no.12:163-168  
'63. (MIRA 17:1)

1. Moskovskiy stanko-instrumental'nyy institut.

GELIER, Yu.A., doktor tekhn.nauk, prof.

Improving the structure of high-speed steel in ingots, rolled products and forgings. Stal' 23 no.9:831-834 S '63. (MIRA 16:10)

1. Moskovskiy stankoinstrumental'nyy institut.

LAKHIN, Yuriy Mikhaylovich; GELER, Yu.A., prof., doktor tekhn.  
nauk, red.

[Metals and their heat treatment] Metallovedenie i termal-  
cheskaya obrabotka. Moskva, Metallurgiya, 1964. 471 p.  
(MIRA 17:10)

ACCESSION NR: AP4019814

S/0279/64/000/001/0136/0142

AUTHORS: Kremnev, L. S. (Moscow); Geller, Yu. A. (Moscow)

TITLE: Tungsten effect on the properties of high speed steels

SOURCE: AN SSSR. Izv. Metallurgiya i gornoye delo, no. 1, 1964, 136-142

TOPIC TAGS: steel, high-speed steel, tungsten, vanadium, WV steel, steel grain size, carbide phase in steel, WV effect on carbide,  $M_6C$  content in steel, VC content in steel, P18 high speed steel

ABSTRACT: Experiments were performed to study the effect of tungsten on the properties of high-speed steels, particularly its effect on the grain size and on the quantity of carbide phase. The samples contained 4-18% W. It was established that the steel properties do not bear a direct linear relation to W content. There were two characteristic W concentrations in steels; one of 12-13%, the other of 7-8% (at 1.5% vanadium). Steels with 12-13% W contained a carbide phase  $M_6C$  rich in W in the presence of vanadium; steels with 18% W and free of vanadium also contained this phase. The increase in W content from 12 to 18% did not change substantially the quantity of  $M_6C$ . Experiments showed that the greatest ..

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ACCESSION NR: AP4019814

quantity of vanadium was dissolved in  $M_6C$  of the 12-13%W steels in which the quantity of solid vanadium carbide VC was small. For this reason hot strength of vanadium-bearing high-speed steels reaches its maximum at 12-13% of W concentration. The technical properties of steel containing 12-13% W and 1.5-1.9% of V did not differ from those of the common P18 steel. Tungsten concentration of 7-8% was the necessary minimum for achieving the secondary hardness in high-speed steels. Steel of this type may be used as a substitute for P18 steel in producing cutting tools for work under light cutting loads. Orig. art. has: 1 table and 6 figures.

ASSOCIATION: none

SUBMITTED: 10Jul63

DATE ACQ: 31Mar64

ENCL: 00

SUB CODE: ML

NO REF SOV: 003

OTHER: 004

Card 2/2

KOSSOVICH, G.A.; GELLER, Yu.A.

Structure and properties of molybdenum alloyed rapid steels.  
Metalloved. i term. obr. met. no.5:3-9 My '64.

(MIRA 17:6)

1. Vsesoyuznyy nauchno-issledovatel'skiy instrumental'nyy  
institut.



S/0122/64/000/007/0053/0060

ACCESSION NR: AP4042910

AUTHOR: Geller, Yu. A. (Doctor of technical sciences, Professor)

TITLE: Contemporary stamping of steel for cold deformation

SOURCE: Vestnik mashinostroyeniya, no. 7, 1964, 53-60

TOPIC TAGS: steel, cold deformation, plastic deformation, alloyed steel/ Kh12M steel, Kh12F1 steel, U11 steel, U12 steel, 11Kh steel, Kh12 steel, R7T steel

ABSTRACT: The author reviewed the various modern developments in the process of producing steel stampings. Different commercial steels were compared as to the following properties: 1) resistance to high pressures; 2) resilience under dynamic loads; 3) resistance to plastic deformation; 4) heat resistance; 5) ability to produce minimal changes in size. Both bulk stampings and layer stampings were studied and the advantages of a number of varieties of steel were examined. Alloy steels Kh12M and Kh12F1 were found to have proper strength, but their resilience did not exceed 2-3 kg/cm<sup>2</sup>. Steels U11, U12, 11Kh, Kh12, R7T, and others were studied. Orig. art. has: 1 table and 3 figures.

ASSOCIATION: none

Card 1/2

ACCESSION NR: AP4042910

SUBMITTED: 00

ENCL: 00

SUB CODE: MM

NO REF SOV: 006

OTHER: 000

Card 2/2

GFLER, Yu.A.; GOLUBEVA, Ye.S.

Investigating the erosion resistance of die steel. Izv. vys.  
ucheb. zav.; chern met. 7 no.9:148-154 '64.

(MIRA 17:6)

1. Moskovskiy stanko-instrumental'nyy institut.

L 8665-65 EWP(h)/T/EWP(k)/EWP(b) - PC-4 - SSD/AFETR/ASD(f)-2/ASD(m)-3/AFWL - KFW/  
JD/HW  
ACCESSION NR: AP4044284 S/0182/64/000/008/0012/0015

AUTHOR: Geller, Yu. A., Golubeva, Ye. S.

TITLE: The properties of die steels currently used for drop forging 4 B

SOURCE: Kuznechno-shtampovochnoye proizvodstvo, no. 8, 1964, 12-15

TOPIC TAGS: pressing, drop forging, stamping die, die steel, impact strength, heat resistance, steel mechanical property, alloy steel, carbide distribution, hardness, plastic deformation

ABSTRACT: In view of the low heat resistance and impact strength of the 3Kh2V8 steel which is commonly used for stamping dies, screening tests on 18 selected Soviet and Western grades of steel were carried out in order to sort out steel grades more suited for specific uses. Impact toughness, heat resistance, carbide nonhomogeneity, hardness, mechanical strength at 20, 600 and 850C, and plastic deformation were compared and related to chemical composition. Carbide nonhomogeneity, a factor impairing strength and impact toughness, was found to be lower in steel in which W was partially replaced by Mo (4Kh4V2M2F and 4Kh4V4M2FN steels). Heat-resistance was lower (600C) a. when the Cr content was relatively high (about 5%) while the W (2%) or Mo (1%) or Mo (1%)

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L 8665-65

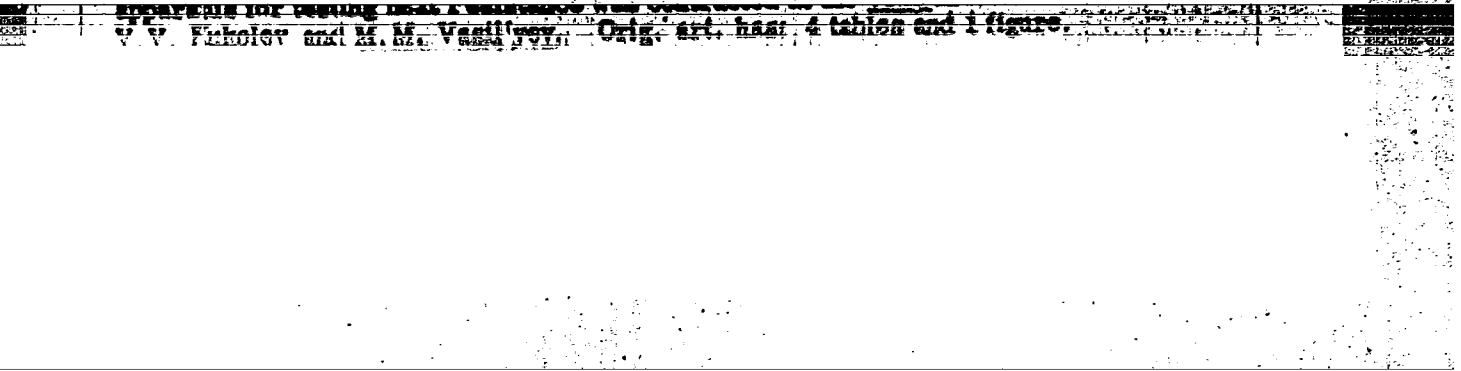
ACCESSION NR: AP4044284

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content was low (4Kh5V2FS, 4Kh5MFS, 4Kh6V7S), and b. when the carbon content was relatively low (about 0.3%: 2Kh4V8 and 3Kh4V2MF). (An increase in vanadium content from 0.5% (4Kh2V8) to 1.1% (4Kx4V8F) increased heat resistance from 650 to 670C. Tungsten more than the other alloying elements improved heat resistance as its content was increased to an optimum of 8%, at which the heat resistance of 4Kh4V8F steel was 670C as compared to 640C for 4Kh4V2MF steel with 2% W. 4Kh5MFS steel, with 5% Cr and 1% Mo, and 3Kh4V2MF steel, with 0.29% C, 4% Cr, 2% W and 1% Mo, showed the highest heat resistance combined with a high impact toughness of 5.4 and 11.8 kg/cm<sup>2</sup> at 20 and 650C, respectively, for the former, and 5.0 and 11.5 kg/cm<sup>2</sup> at 20 and 650C respectively, for the latter. The behavior of the steels examined during pressing was a complex function of many, often countereacting, characteristics. The

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Card 8/8

1 8881 64 ENT(4) EMP(5) ASD(4)-3 MJN/JD/JG  
ACCESSION NR: AP4946815 S/0148/64/000/009/0148/0154

AUTHOR: Geller, Yu. A.; Ye. S. Golubeva

TITLE: Investigation of crack formation in steel dies

SOURCE: IVUZ. Charnaya metallurgiya, no. 9, 1964, 148-154

TOPIC TAGS: steel die stability, steel die annealing crack, annealing crack, tungsten steel, carbide steel, martensite, die stability, steel mechanical property, die cracking, chrome steel, vanadium steel

ABSTRACT: Many dies are prematurely damaged due to the formation of annealing cracks. In general, die stability depends on the steel structure and content of alloying elements, which determine the impact strength and heat resistance of the steel. In the present paper, simultaneous tests were carried out on the annealing crack stability and mechanical properties of 16 types of alloy steel used for stamping dies. The chemical composition, annealing temperature, impact strength, heat resistance and hardness of the steels are tabulated. The samples had a No. 10 grain with either a martensitic structure or a martensitic structure with excess carbides, and had a Rockwell hardness of 45 - 50. Cylindrical samples (20 mm in diam. and 60 mm long) were surface heated to 760C, the same temperature at which the dies operate. The depth of the heated layer

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L 8763-65

ACCESSION NR: AP4045815

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was 1.2-1.5 mm. The stability was estimated from the total length of cracks after 15-25 heating cycles. When samples having a Rockwell hardness of 50 were incompletely (4 sec) and completely (17 sec) cooled, the following results were obtained, the total crack length being given in the numerator for incomplete cooling and in the denominator for complete cooling:

steel 4Kh2V8 = 57/none (5 cycles), 150/108 (25 cycles), 241/114 (50 cycles);  
steel 4Kh4V2MF = none (5 cycles), 23/18 (25 cycles), 38/28 (50 cycles);  
steel 3Kh4V2MF = none (5 cycles), 2/none (25 cycles), 2/none (50 cycles).

During incomplete cooling the lower layers retain a high temperature. Thus the temperature gradient between the upper and lower layers varies constantly, lowering the number of cycles required to bring about the appearance of the first cracks. These tests showed that crack stability varies significantly, steel with a high tungsten content having the lowest stability. Other tests showed that crack stability is inversely related to the heat resistance, which increases in direct proportion to the tungsten content. Steel containing molybdenum has almost the same heat resistance and a much higher crack resistance. The effect of chromium on crack stability depends on the tungsten content in the steel.

Card

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L 8763-65

ACCESSION NR: AP4045815

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while all tests showed a negative effect of nickel on crack stability. Carbon had a significant negative effect on the crack stability of all steels, regardless of tungsten content and heat resistance. Significant data were obtained by comparing the crack stability and mechanical properties of the tested steels. Thus, steel with high crack stability also had a high impact strength under both normal and high temperatures. A higher impact strength and lower hardness can be obtained by increasing the disintegration of the solid solution and the carbide coagulation. Increasing the tungsten content not only hampers disintegration of the solid solution, but also hampers carbide coagulation, thus lowering crack stability. On the basis of the performed tests, the authors conclude that annealing crack stability can be estimated by the simple method of impact strength testing. "The testing device was built at the VNI under the direction of V. V. Kukolev and M. M. Vasil'yev." Orig. art. has: 4 figures and 3 tables.

ASSOCIATION: Moskovskiy stroko-instrumental'nyy institut (Moscow Machine-Tool Institute)

SUBMITTED: 14Mar63

ENCL: 00

SUB CODE: MM

NO REF SOV: 005

OTHER: 003

Card 3/3

BAVARAI, A.E.; GEMER, Yu.I.

Determining the temperability of highly temperable steels.  
Zav. lab. 30 no.7:819-821 '64. (MIRA 18:3)

1. Moskovskiy stankoinstrumental'nyy institut.

GELLER, Yu.A., doktor tekhn.nauk, prof.

Recent die steels for cold  
J1 '64.

. Vost. 1964  
(MIRA 1969)

L 56053-65 EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(x)/EWP(y)/EWA(c) IJP(c)  
JD/HW/JG

ACCESSION NR: AP5010556

UR/0129/65/000/004/0039/0044  
669.14.018.25:669.28

30  
27  
B

AUTHOR: Moiseyev, V. F.; Geller, Yu. A.

TITLE: Effect of cobalt on the structure and properties of high-speed steel

SOURCE: Metallovedeniya i termicheskaya obrabotka metallov, no. 4, 1965, 39-44

TOPIC TAGS: high speed steel, steel structure, steel mechanical property, cobalt admixture, tungsten admixture, carbide separation, steel phase analysis, Theta phase, steel conductivity, steel hardness

ABSTRACT: High-speed steels containing 9, 12, 15, and 18% W and 5 and 10% Co were investigated. Cobalt does not affect the grain size, which is determined only by the content of vanadium and tungsten; nor does it increase the amount of carbides; it is not found in the carbide phase. Phase analysis did not confirm the hypothesis that cobalt inhibits the separation of carbides from martensite. Measurements of the coercive force and strength and analysis of the phase diagram of Fe-W-Co support the hypothesis that cobalt promotes the separation of intermetallic compounds. The structural inhomogeneity characterizing high speed steels may cause the separation of the  $\theta$  phase (containing Co) in localized regions. The presence of even small amounts of this phase, which is difficult to observe by

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L 56053-65

ACCESSION NR: AP5010556

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x-ray diffraction or microanalysis, accounts for the following unique differences between high-speed cobalt steels and cobalt-free steels: (1) Co increases the hardness of annealed steel more than W; (2) Co increases the amount of the "carbide" deposit separating in electrolytic dissolution; (3) Co enhances the "carbide" inhomogeneity of steel; (4) Co, which does not affect the W content of martensite in hardened steel, markedly decreases it in tempered steel; (5) Co changes the saturation magnetization; (6) Co increases the secondary hardness; (7) the effect of Co on the red hardness varies with the W content; (8) in steels with a high W content, Co has a negative effect on the strength; (9) Co is the only alloying element of high-speed steel which improves the thermal conductivity. Each of these points is discussed. The article is appended by an editor's note, as follows: "The hypothesis that cobalt forms an intermetallic compound in high-speed steels (forged, without a  $\delta$  component) has no direct evidence to support it." Orig. art. has: 3 figures and 2 tables.

ASSOCIATION: Moskovskiy stankoinstrumental'nyy institut (Moscow Machine-Tool and Instrument Institute)

SUBMITTED: 00

ENCL: 00

SUB CODE: MM

NO REF SOV: 002

OTHER: 002

Card

2/2

PAVARAS, A.E.; GELLER, Yu.A.

Effect of residual austenite on the strength of tool steel.  
Metalloved. i term. obr. met. no.4:45-48 Ap '65.

(MIRA 18:6)

1. Moskovskiy stankoinstrumental'nyy institut.

SEMICHASTNAYA, A.V. (Moskva); GELLER, Yu.A. (Moskva); MATVEYEVA, M.F. (Moskva)

Investigating the irreversible temper brittleness of spring steel.  
Izv. AN SSSR. Met. no.4:150-155 JI-Ag '65.

(MIRA 18:8)



L 24P33-25 ENT(a)/EWT(b)/EWP(w)/ENP(1)/EPF(n)-2/ENG(m)/ENA(d)/EPR/T/EWP(t)/  
ENP(z)/ENP(b)/ENA(c) Ps-A/Pc-A IJP(c) JD/JG/AT/WI  
ACCESSION NR: AP5012329 UR/0149/65/000/005/0152/0156  
659.15-194 : 659.27'26'292 : 620.17,17

AUTHOR: Celler, Yu. A.; Moiseyev, V. G.

TITLE: The effect of titanium<sup>27</sup> and niobium<sup>27</sup> on the properties<sup>16</sup> of high speed steel <sup>47</sup>  
<sup>8</sup>

SOURCE: IZVUZ. Chernaya metallurgiya no. 5, 1965, 152-156

TOPIC TAGS: high speed steel, metal physical property, metal mechanical property,  
titanium, niobium

ABSTRACT: The properties of steel with various tungsten contents and with varying  
amounts of undissolved carbides are studied to determine the most effective amount  
of Ti or Nb addition. The relative effectiveness of Ti and Nb high melting carbides  
dispersed in small amounts in austenite is shown. The inhibiting action towards  
grain growth is maximized by additions in the order of .1-.2% Ti and the quenching  
temperature for a given grain size is maximized at 10% W. A discussion of the TiC  
and NbC retardation of grain growth is offered. The amount of retained austenite  
and its dependence on the amount of carbon in solution before quenching is observed  
in relation to the amount of W and the maximum temperature of "red-hardness." The

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L 58713-15  
ACCESSION NR: AP5013329

2  
Maximum temperature of "red-hardness" is either increased or decreased (depending on the tungsten content) upon addition of Ti or Nb. Due to grain growth, higher quenching temperature lowered the strength of all the steels. Increased W content causes unequal distribution of carbides which results in lower strength. The Ti and Nb content did not affect the strength of the 12-15% W steels. The optimal alloy was found to contain 9-10% W with a 0.2% Ti addition. Orig. art. has: 1 figure, 2 tables.

ASSOCIATION: Moskovskiy stankoinstrumental'nyy institut (Moscow Machine Tool Institute)

SUBMITTED: 23Jun64

ENCL: 00

SUB CODE: MM

NO REF SOV: 004

OTHER: 000

Card 2/2

GELLER, Yu.A., prof., doktor tekhn. nauk; MEL'NICHENKO, Ye.V., inzh.

Effect of the duration and temperature of annealing on the  
properties of high-speed steel. Stal' 24 no.12:1123-1125 D '64.  
(MIPA 18:2)

2 196-66 EWP(a)/EWA(d)/EWP(t)/EWP(z)/EWP(b)/EWA(h) IJP(e) JD/JG

ACC NR: AP5024976

SOURCE CODE: UR/0286/65/000/016/0039/0039

AUTHORS: Kossovich, G. A.; Geller, Yu. A.; Olesova, Ts. L.

ORG: none

TITLE: High speed steel. Class 40, No. 177790

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 16, 1965, 39

TOPIC TAGS: high speed steel, carbon, sulfur, manganese

ABSTRACT: This Author Certificate presents a high-speed steel that contains tungsten, chromium, vanadium, and molybdenum. To improve its technical properties and its stability, the following composition is selected, in %:

carbon	0.8-0.9	sulfur	0.03
chromium	3.0-3.5	phosphorus	0.03
tungsten	8.5-10.0	silicon	0.4
molybdenum	3.5-4.1	manganese	0.4
vanadium	1.8-2.2		

SUB CODE: MM/ SUBM DATE: 27Dec62/

Card 1/1

UDC: 669.14.018.252.3

1. Further Development of...

Further Development of... (MIRA 18:8)

1. More quickly...

SHNYEROV, Ya.; MEN'NIKOV, I.Y.; DANICH, B.I.; SAVCHENKOV, V.A.; POLYAKOV, V.P.;  
ARISTOV, N.I.; GIL'BER, Yu.

Mechanical properties of semi-skilled and capped St 3ps and St 3kp  
steels. Metalloved. i term.cbr.met. no.9:2-8 S '65.

(MIRA 18:10)

1. Ukrainskiy nauchno-issledovatel'skiy institut metallov.

L 00024-66 EWT(m)/EWA(d)/T/EWP(t)/EWP(s)/EWP(b) - MJW/JD

ACCESSION NR: AP5022575

UR/0129/65/000/009/0018/0021  
669.14.018.25:620.17

AUTHOR: Aristov, N. P.; Geller, Yu. A.

TITLE: Properties of tool steels used as machine steels

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 9, 1965, 18-21

TOPIC TAGS: tool steel, induction hardening, case hardening, machine steel, metal heat treatment, grain structure

ABSTRACT: The introduction of new methods of surface hardening, particularly those based on induction heating with high-frequency currents, has made it possible in many cases to dispense with the labor-consuming process of case-hardening and to further mechanize and automate the heat treatment of metals. Furthermore, it is expedient to use tool steels for the fabrication of certain machine elements for which a highly wear-resistant surface is required. In this connection the authors describe comparative investigations of the principal mechanical properties of tool steels and case-hardened steels with the object of selecting a high-carbon tool steel whose properties best correspond to the properties

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43  
31  
B

L 00024-66

ACCESSION NR: AP5022575

12

of case-hardened steels. Rod specimens (diameter 18-25 mm, length > 3 mm) of these steels were subjected to a microstructural examination and to different regimes of heat treatment, and, subsequently, subjected to mechanical tests. Findings: In case-hardened steels the structure was that of small grains of ferrite along with a small amount of finely laminar pearlite while in tool steels the structure was in most cases that of granular pearlite with a small number of structurally free carbides; normalization prior to quenching is the optimal regime of heat treatment for case-hardened steels, while for tool steels high-temperature tempering at 650°C is recommended. Following the heat treatment of both types of steels, the two most important mechanical properties: yield point and impact toughness, are much higher for tool steels than for case-hardened steels. Hence the use of tool steels hardened by induction heating in place of case-hardened steels is warranted, especially in cases where the case-hardened steels are of the carbon, chromium, and manganese-chrome types (15<sup>1</sup>, 20<sup>1</sup>, 15Kh<sup>1</sup>, 20Kh<sup>1</sup>, 18XNGT). Of the tool steels, U7<sup>1</sup>, 85KhF<sup>1</sup>, Kh<sup>1</sup>, and Kh06 display the optimal properties. Orig. art. has: 1 figure, 2 tables. 27

ASSOCIATION: Moskovskiy stanko-instrumental'nyy institut (Moscow Machine Tool and Tool Institute)

Card 2/3

44,55



L 00024-66

ACCESSION NR: AP5022575



SUBMITTED: 00

ENCL: 00

SUB CODE: MM, MT

NO REF SOV: 000

OTHER: 000

Card 3/3

ACC NR: AP7000594

SOURCE CODE: UR/0129/66/000/011/0035/0039

AUTHOR: Brostrom, V. A.; Geller, Yu. A.

ORG: Moscow Machine Tool and Tool-Making Institute (Moskovskiy stankoinstrumental'nyy institut)

TITLE: Transformations and properties of high-speed alloys with intermetallide hardening

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 11, 1966, 35-39

TOPIC TAGS: high speed alloy, iron base alloy, metal cutting, cutting tool, tool steel, hardness, phase composition / V27K25 high speed alloy, V27K25N3 high speed alloy, V27K25G4 high speed alloy, V27G25N2Kh2 high speed alloy, V27K25Kh4 high speed alloy, V20M7K25 high speed alloy

ABSTRACT: Certain alloys of the Fe-Co-W system which undergo  $\gamma$ - $\alpha$  transformation of a martensitic nature display exceptionally high hardness ( $H_{RC}$  68-70) which is greatly resistant to tempering (tempering at 600°C for 25 hr reduces this Rockwell hardness by only one point). But the utilization of these alloys in toolmaking is complicated by their considerable brittleness. It has been established that in some cases such brittleness can be reduced by treating these alloys with small amounts of Ni, Mn, Cr, Ti or V. So far, however, the effect of these

Card 1/4

UDC: 620.17:669.14.3

ACC NR: AP7000594

alloy elements on the properties of alloys of this kind has not been investigated. To fill this gap, the authors investigated the effect of Mn, Ni and Cr on the properties of alloys containing 18.9-27.9% W, 24.3-25.1% Co, up to 0.1% C, 0.5-0.6% V and 0.1-0.2% Ti, with Fe as the remainder.

Table

Name of alloy	Content of elements in %				
	C	W	Co	Cr	Ni
V27K25	0.06	26.1	24.5	-	-
V27K25N3	0.07	25.0	24.3	-	3.2
V27K25G4*	0.06	25.8	24.5	-	-
V27G25N2Kh2	0.06	25.7	25.0	1.9	1.9
V27K25Kh4	0.07	27.9	25.1	3.7	-
V20M7K25 **	0.08	18.9	24.9	-	-

\* 4.1% Mn

\*\* 6.6% Mo

Card 2/4

ACC NR: AP7000594

The alloys were heated in a salt bath and quenched from 1300°C in oil (such heating assures greater resistance to tempering than quenching from 1250°C) and tempered at 300-1000°C for 2 hr. Radiographic examination showed that all the alloys (except V27K25Kh4 which contains 70-80% of  $\gamma$ -phase) consist of  $\alpha$ -solid solution and  $\theta$ -phase. After this, the alloy specimens were subjected to Rockwell red hardness tests and their saturation magnetization, electrical resistivity and lattice parameter were analyzed. Findings: Treatment with Cr, Mn, Ni reduces red hardness only insignificantly so that it still remains higher ( $H_{RC}$  59-62) than that of comparably heat-treated high-speed steel R18. Cutting properties were evaluated during machining with tools tipped with these alloys. It was established that the permissible cutting rate was 10.4 m/min for tools tipped with V27K25 and V20M7K25 alloys compared with 6.2 m/min for tools tipped with R18 steel; the findings for the alloys additionally treated with Cr, Ni and Mn were not as satisfactory. The investigated alloys may be divided into two groups according to the composition of their hardening phases: group 1, containing the alloys V27K25 and V20M7K25 and group 2, containing the alloys treated with Ni, Mn and Cr. In group 1 a sharp increase in the solubility of W (as evidenced by measurements of saturation magnetization and electrical resistivity) sets in at 900-950°C, whereas in group 2 this sets in at 750-850°C. This indicates that the two-phase  $\alpha + \gamma$  region of the alloys exists at these temperatures. The machining of such relatively nonmachinable materials as 30Kh10G10 steel involves the rise of high temperatures in the surface layers of the cutting tools, and the alloys with higher temperatures of the recryst-

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ACC NR: AP7000594

tallization of the  $\alpha$ -solid solution and of  $\alpha \rightarrow \gamma$  transformation will thus display higher hardness, strength and wear resistance at high temperatures. This accounts for the superiority of alloys in group I and particularly the alloy V20M7K25 in which 7% of W is replaced with Mo (6.6%). By contrast, treatment with Mn, Ni and Cr reduces the temperature of phase transformations and adversely affects the cutting properties and strength of the alloys. Orig. art. has: 3 tables, 3 figures.

SUB CODE: 13, 11, 20/ SUBM DATE: none/ ORIG REF: 003/ OTH REF: 003

Card 4/4

ACC NR: AP7005397

SOURCE CODE: UR/0148/67/000/001/0142/0145

AUTHOR: Brostrem, V. A.; Geller, Yu. A.; Lozinskiy, M. G.

ORG: Moscow Institute of Machine Tools and Instruments (Moskovskiy stankoinstrumental'nyy institut)

TITLE: A method for determining the red hardness of high-speed alloys

SOURCE: IVUZ. Chernaya metallurgiya, no. 1, 1967, 142-145

TOPIC TAGS: hardness, high speed alloy, dispersion hardening, iron base alloy, tungsten containing alloy, cobalt containing alloy

ABSTRACT: Methods are developed for determining the red hardness of precipitation-hardened alloys. The following alloys were studied in the Fe-Co-W system with additions of molybdenum, chromium, manganese and nickel: V27K25, V20M7K25, V27K25Kh4, V27K25G4, V27K25N3, V20M7K30 and V20M7K20. Control tests were also conducted using R18 standard high-speed steel. The results were compared with the variation in hardness after two hours of annealing in the same temperature range. The dispersion-hardened specimens were quenched after heating to 1300°C and holding for 4 minutes, and then tempered at 600°C for 2 hours. Conventional heat treatment was used on the specimens of R18 steel (quenching from 1280°C, triple annealing at 560°C). The Vickers hardness was measured under a load of 1 kg on a UIMV-1 installation with heating in a vacuum to 20, 500 and 600°C with following measurements every 50° to 850°C. The re-

Card 1/2

UDC: 669.018.25:620.172.251.222

ACC NR: AP7005397

sults show only slight differences in the red hardness of dispersion-hardened alloys as determined from hardness measurements in the cold state after heating to 700-750°C (2-3 HRC units). At the same time, the alloys differ considerably with respect to hot hardness: for instance V27K25 and V20M7K25 show a hardness of 400-430 HV at 750°C while V27K25G4 and V27K25N3 alloys show a hardness at this same temperature of only 170-190 kg/mm<sup>2</sup>. A direct relationship was observed between the hot hardness and the cutting properties of the alloys. Machining tests using tools made from the various alloys for continuous turning of 1Kh18N9T steel at a speed of 33 mm/min and a feed rate of 0.3 mm/rev taking a cut of 1 mm gave stabilities of 18, 20, 5, 3 and 3 minutes for V27K25, V20M7K25, V27K25N3 and V27K25G4 alloys and R18 high-speed steel respectively. With continuous turning of 30Kh10G10 steel, the stability of V20M7K25 and V27K25 alloys was 20 times higher than that of V27K25G4 and V27K25N3 alloys and R18 steel. The discrepancies between hardness and cutting properties indicate that the temperature for beginning of the  $\alpha$ - $\gamma$ -transformation in V27K25 and V20M7K25 alloys is 920-910°C, while the corresponding temperature for V27K25G4 and V27K25N3 is 750-770°C. This conclusion is confirmed by measurements of resistivity and coercive force. Orig. art. has: 2 figures, 2 tables.

SUB CODE: 11/ SUBM DATE: 18Feb66/ ORIG REF: 03

Cord 2/2

GILLER, E.I.

Modernising single-drum steam boilers with small-diameter drums.  
Energ.biul. no.1:9-16 Ja '54. (MLRA 7:1)  
(Steam boilers--Design)



GELLER, Z. I.

AID P - 794

Subject : USSR/Engineering  
Card 1/1 Pub. 28 - 4/11  
Author : Geller, Z. I. (Heller)  
Title : The use of stepped evaporation in industrial boilers  
Periodical : Energ. byul., #7, 18-20, J1 1954  
Abstract : Two stage evaporation is used for purification of boiler feed water. The test results presented indicate considerable improvement in quality of water. One chart and 3 Russian references (1938-1954).  
Institutions: All-Union Heat Engineering Institute (VTI) and All-Union Electrical Institute (VEI). Office for the Organization and Rationalization of Regional Electric Power Plants and Network (ORG RES) and Ministry of Electric Power Plants (MES)  
Submitted : No date

GELLER, Z. I.

AID P - 799

Subject : USSR/Engineering  
Card 1/1 Pub. 28 - 9/11  
Author : Geller, Z.I. (Heller)  
Title : Problem on efficient use of heat of exhaust gases  
Periodical : Energ. byul., #7, 28, J1 1954  
Abstract : Comments relate to the air leakage to the gas chamber of the air preheater described in Energ. byul., #3, 1954. The heat of exhaust gases from the industrial furnace is transmitted to the air by means of solid mineral particles continuously passing through the gas and air chambers.  
Institution : None  
Submitted : No date

AID P - 2154

Subject : USSR/Engineering

Card 1/1 Pub. 28 - 5/9

Author : Z. I. Geller

Title : ~~The reconstruction of steam separators of a two-drum boiler~~

Periodical: Energ. byul., no.5, 19-24, My 1955

Abstract : This is a description of the reconstruction of a two-drum, vertical, watertube-type boiler involving mainly the alteration of the steam-separating device of a rated 55 to 60 tons per hour generating capacity. This boiler produced only 48 to 52 tons of steam per hr. In the two years since reconstruction it has produced 58 to 60 tons per hr of a higher quality and also has required less frequent blow-outs. Four diagrams and 1 graph illustrate the text.

Institution: None

Submitted : No date

AID P - 2370

Subject : USSR/Engineering

Card 1/1 Pub. 28 - 4/13

Authors : Geller, Z. I. and Rastorguyev, Yu. L.

Title : Use of viscous petroleum-residue as fuel

Periodical : Energ. Byul., 6, 10-14 Je 1955

Abstract : The residue after first distillation of petroleum (mazut) until recently was freely used for fuel purposes. It was then found valuable for further distillation, and accordingly its wide use as a fuel has been restricted. The mazut which is now used as boiler fuel is a compound of petroleum residues with certain distillates. The fact that the compound must meet the requirements of GOST 1501-42 is criticized. The authors also describe results of their observation of the use of a new fuel compound, and give two drawings and 2 graphs in illustration of their findings.

Institution: None

Submitted : No date



AID P - 2792

• Subject : USSR/Engineering  
Card 1/ 2 Pub. 28 - 1/13  
Author : Geller, Z. I.  
Title : ~~Stage evaporation and steam separation of SM-type~~  
boilers  
Periodical : Energ. byul. 8, 1-6, Ag 1955  
Abstract : The author describes with much detail the reconstruction of the SM-type steam boilers built by the Taganrog Boiler Plant, mostly for use by heat and electric power plants. These boilers were not fully satisfactory in several respects, but after their system of evaporation and their separator arrangement were rebuilt, their steam generation was increased from 17-20 to 27 and even to 29 tons per hour. The blowing out periods were reduced from 12-14% to 1.5-2.5%, and production of much cleaner steam obtained. Three diagrams and 1 graph of boiler rejuvenation.

AID P - 2792

Energ. byul. 8, 1-6, mg 1955

Card 2/2 Pub. 28 - 1/13

Institution : State Institute for Planning Petroleum Industry  
Establishments (Giproenergoneft').

Submitted : No date

GELLER, Z.I.

Burning high-viscosity extracts. Energ.biul. no.2:27-30 F '56.  
(MLRA 9:5)

(Boilers) (Petroleum as fuel)



GELLER, Z.I., kandidat tekhnicheskikh nauk.

Use of high-viscosity cracking wastes as boiler and furnace fuel.  
Teploenergetika 3 no.10:25-30 0 '56. (MLRA 9:11)

1. Groznenskiy neftyanoy institut.  
(Petroleum as fuel)

GELLER, Z. I.

1602. INFLUENCE OF CARBOIDS ON THE PROPERTIES OF CRACKING RESIDUES.  
 Geller, Z. I. Zhurnal Priklad. Khim. 1959, 32, 15-20; abstr. in Chem. Abstr. 1959, 53, 10719c.  
 Carboids (1) in cracked residues (2) cause a decrease in the heating value of the residue, since each per cent of carbon in the residue reduces its heating value by about 0.2%. The residues usually contain 2-3% of carbon. The residues containing < 68% carbon and 2.5% carbon have a heating value of 15.3%. The properties of the residues are improved by use of special spray-drying and precipitation of 1.

171 LFI

1000

GELLER, Z.I.

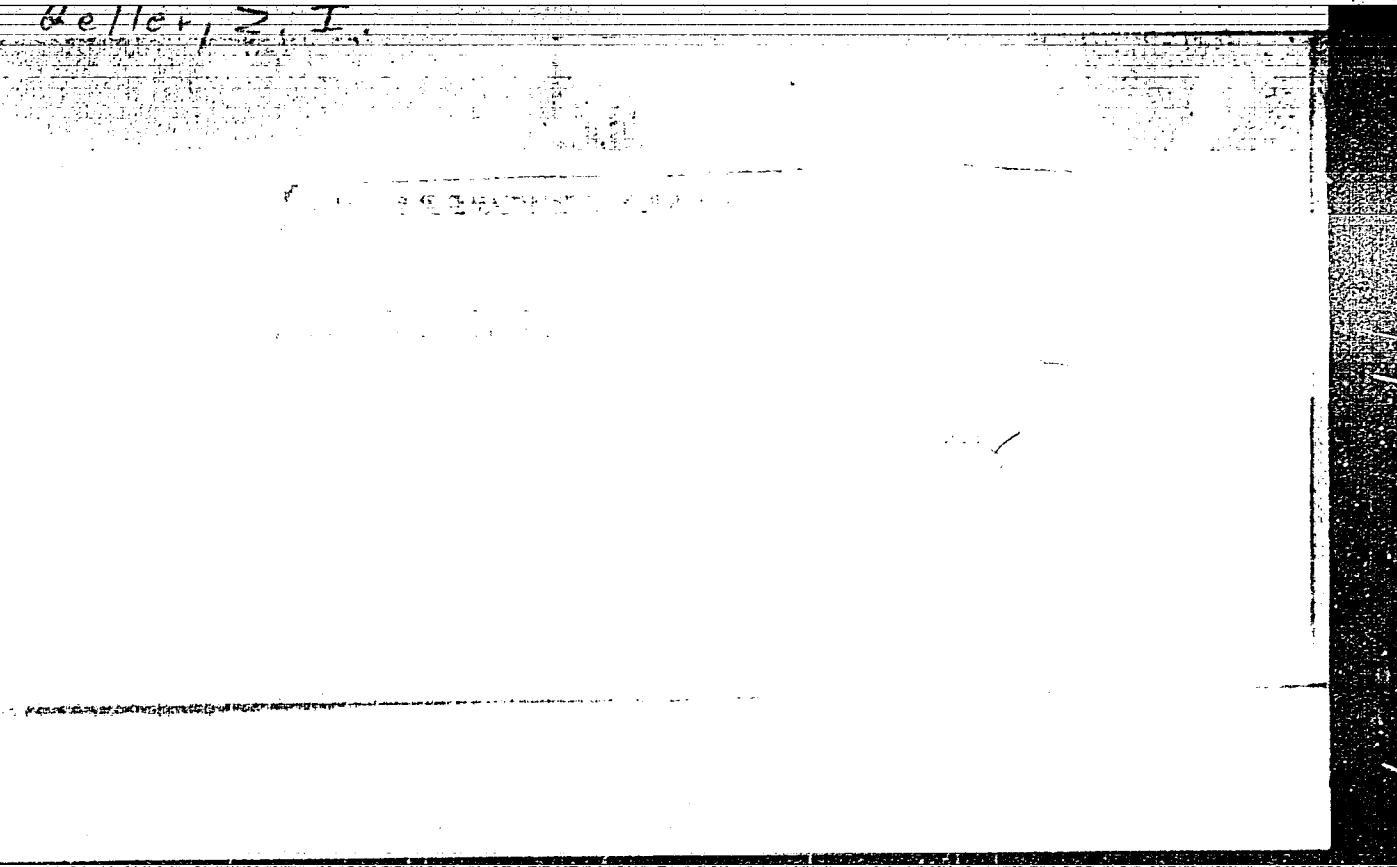
Simple design of removable cyclones; a discussion. *Energ. biul.*  
no.6:22-23 Je '56. (MLBA 9:8)  
(Steam separators)



AID P - 5102

Subject : USSR/Engineering  
Card 1/1 Pub. 110-a - 5/18  
Author : Geller, Z. I., Kand. Tech. Sci.  
Title : ~~Using highly viscous cracking residues as fuel for boilers and furnaces.~~  
Using highly viscous cracking residues as fuel for boilers and furnaces.  
Periodical : Teploenergetika, 10, 25-30, 0 1956  
Abstract : Characteristics are given of basic highly viscous cracking residues needed for efficient handling and using of fuel. 5 tables, 4 diagrams. 5 references.  
Institution : Groznyy Petroleum Institute  
Submitted : No date

*Weller, Z. I.*



GELLER, Z. I.

4180. EFFECT OF CONCENTRATION OF CARBON DIOXIDE IN THE AIR ON THE RATE OF BREATHING

with the use of a special apparatus...  
The results show that...  
The rate of breathing...  
increases with the concentration of carbon dioxide in the air.

*Handwritten signature or initials*

GELLER, Z. I.

USSR/Processes and Equipment for Chemical Industries  
Processes and Apparatus for Chemical Technology

K-1

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 14201

Author : Geller Z.I.

Inst : Groznyy Petroleum Institute

Title : Experiments on Comminution of Some Materials in a  
Cascade-Impact Blast Mill.

Orig Pub : Tr. Groznensk. neft. in-ta, 1956, No 19, 173-175

Abstract : On the basis of experiments with some ore minerals,  
particularly iron-magnetite and low-phosphorus quart-  
zites, it has been ascertained that the cascade-impact  
mill can be utilized for fine comminution of hard ma-  
terials.

Card 1/1

- 29 -



GOLOMSHTOK, I.S.; GELLER, Z.I.; KUZNETSOV, A.A.; MINASYAN, T.S.

Effectiveness of using the "Bakinskii operation" heat exchanger  
in petroleum refineries. Azerb.neft.khoz. 35 no.5:27-28 My '56.  
(MLRA 9:10)

(Heat exchangers) (Petroleum--Refining)

Geller, Z.I.

65-7-13/14

AUTHOR: Geller, Z.I.

TITLE: On the Problem of Choosing a Viscosimeter for the Analysis of Highly Viscous Cracking-Residues (K voprosu o vybore viskozimetra dlya analiza vysokovyazkikh kreking-ostatkov)

PERIODICAL: Khimiya i Tekhnologiya Topliva i Masel, 1957, No.7, pp. 65 - 68 (USSR)

ABSTRACT: In view of the utilisation of highly viscous cracking-residues as boiler and furnace fuel, it was necessary to choose a viscosimeter suitable for rapid and accurate determination of viscosity. For the determination of the viscosity of heavy petroleum fuels GOST 6258-52 recommends a viscosimeter of the type BY GOST 1532-54 based on the time of flow through an orifice. The possibility of using this viscosimeter for highly viscous cracking residues was tested in the temperature range 80-175 °C. The characteristic data on residues tested and the results obtained are given in Tables 1 and 2, respectively. The results of tests were unsatisfactory. Of other viscosimeters tested, the most suitable was found to be the viscosimeter of the Kheppler type (time of movement of a ball in an inclined tube filled with the liquid tested). It is recommended to carry out a large-scale test of this viscosimeter in a number of laboratories and then, if satisfactory results are obtained, introduce

Card 1/2

65-7-13/14

On the Problem of Choosing a Viscosimeter for the Analysis of Highly Viscous Cracking-Residues

. it into OCT standards. There are 2 tables, 2 figures and 3 Russian references.

ASSOCIATION: Groznyy Petroleum Institute (Groznenkiy neftyanoy institut)

AVAILABLE: Library of Congress  
Card 2/2

~~SECRET~~

Effect of pressure on the viscosity of cracking residue. Energ. biul.  
no.8:25-26 Ag '57. (MIRA 10:8)  
(Fuel) (Combustion)

GELLER, Z.I.

Effect of preliminary heat treatment on the viscous properties of  
cracking residue. Azerb. neft. khoz. 36 no.6:33-34 Je '57.  
(Viscosity) (Cracking process) (MLRA 10:9)

AUTHOR: Geller, Z.I. SOV/90-58-1-6/9

TITLE: On the Operation of Piston Pumps on High-Viscosity Cracking Remains (O rabote porshnevykh nasosov na vysokovyazkikh kreking-ostatkh)

PERIODICAL: Energeticheskiy byulleten', 1958, Nr 1, p 29-31 (USSR)

ABSTRACT: The author describes his experiments with steam-driven direct-acting piston pumps working on high-viscosity oil products. After having given technical data and operational details, he concludes: 1) the delivery coefficient of the steam-driven direct-acting pumps decreases with the increase of the pump stroke number and oil viscosity. An oil viscosity increase provokes a sharp drop in the delivery coefficient; 2) intake capacity of the steam-driven direct pumps at constant resistance of the network decreases with the viscosity decrease (i.e. temperature increase) of the used fuel. There are 1 diagram, 1 nomogram and 1 graph.

Card 1/1

GELLER, Z.I.

Operation of pipelines in pumping highly viscous fuels. Izv.vys.  
ucheb.zav.; neft' i gas 1 no.9:89-96 ' 58. (MIRA 11:12)

1. Groznenskiy neftyanoy institut.  
(Petroleum--Transportation)

AUTHORS:

Volkov, N.F., Geller, Z.I.

SOV/90-58-2-4/9

TITLE:

On Using Air-Heaters for Tubular Furnaces (K voprosu o primenii vozdukhopodogrevateley dlya trubchatykh pechey)

PERIODICAL:

Energeticheskiy byulleten', 1958, Nr 2, pp 17-24 (USSR)

ABSTRACT:

The author recommends using induced draught in air-heating installations attached to the NPZ tubular furnaces. This measure better exploits the thermal energy of the escaping hot smoke, and slows down the clogging of the pipes. After having mentioned two other methods to increase the efficiency of tubular furnaces (introduction of dolomite or lime into gas pipes; system of regenerative air-heaters), he pays special attention to the system called "pipe-within-a-pipe". This system, developed by Engineer A.A. Akhmed-zade in the Zavod im. Andreyeva ("Andreyev" Plant) at Baku in 1948, essentially consists in leading hot smoke through a pipe, which in its turn is very loosely sheathed by another pipe. The Department of Thermotechnics and Hydraulics of the Groznenskiy neftyanoy institut (Oil Institute of Groznyy) carried out the tests on this system and decided in favor of the system for cases where its installation is technically

Card 1/2



NOV/90-58-2-4/9

On Using Air-Heaters for Tubular Furnaces. For Discussion.

possible and financially expedient. The calculations needed by the system were prepared by the Department, as well as the nomogram for making the calculations easier. The conclusions of the author are: 1) reliable operation of the tubular air-heaters attached to the NPZ furnaces can only be ensured in combination with induced draught; 2) regenerative air-heaters are essentially better than tubular ones. There are 2 tables, 1 nomogram and 9 Soviet references.

1. Furnaces---Equipment    2. Heaters---Performance    3. Heaters  
---Test methods    4. Mathematics

Card 2/2

AUTHOR: Geller, Z.I. 90-58-5-5/10

TITLE: The Use of Extraction Cyclones in the Boiler Room of the Groznyy Oil Refinery (C primenenii konstruktsii vynosnykh tsiklonov v kotel'noy groznenskogo neftepererabatyvayushchego zavoda)

PERIODICAL: Energeticheskiy Byulleten', 1958, Nr 5, pp 16-19 (USSR)

ABSTRACT: The article contains part of a discussion between the author, B.A. Benediktov, and L.M. Klebanov about the proposed construction of a cyclone in the boiler room of the Groznyy Oil Refinery, where only one pipe would be used for the introduction of the water-steam mixture. The quality of the steam is cited as characteristic of the construction. There are 2 Soviet references.

AVAILABLE: Library of Congress

Card 1/1 1. Steam separators-Applications 2. Boilers-Equipment

SOV-3-58-9-29/36

CELLER, Z. I.

AUTHOR: Korneyev, Yu.K.

TITLE: In the Scientific-Technical Council (V nauchno-tekhnicheskoye sovete). A Special Meeting of the Petroleum Industry Section (Vyvezdnoye zasedaniye sektsai neftyanoy promyshlennosti)

PERIODICAL: Vestnik vysshey shkoly, 1958, Nr 9, page 77 (USSR)

ABSTRACT: In May 1958, 12 scientists of the Moscow and Ufa Petroleum Institutes, and of the Azerbaydzhanskiy industrial'nyy institut (Azerbaydzhan Industrial Institute) - members of the Section of Petroleum Industry of the Scientific-Technical Council, USSR Ministry of Higher Education - went to Groznyy to become familiar with the organization of scientific-research work at the Groznenskiy neftyanoy institut (Groznyy Petroleum Institute). Docent A.G. Orkin, Deputy Director of the Groznyy Petroleum Institute, reported at a meeting on the fulfilment of the plan of scientific-research work for 1957 and of the tasks for 1958. The research work carried out in 1957 was of great practical significance to the petroleum and gas industry of the Northern Caucasus. Among the works were the following: "The Hydrogeology of the Mesozoic Deposits of the Caucasus" (Chair of Oil Field Geology, headed by Professor G.M. Sukharev), "Examining Radiational Heat Exchange in Tu-

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AUTHOR: Celler, Z.I.

SOV-90-58-10-6/9

TITLE: An Investigation into the Working Conditions of Type-KSM Sectional Pumps in High-Viscosity Cracking Refuse (Issledovaniye usloviy raboty sektionnykh nasosov tipa KSM na vysokovyazkom kreking-ostatke)

PERIODICAL: Energeticheskiy byulleten', 1958, Nr 10, pp 16 - 22 (USSR)

ABSTRACT: The authors describe tests carried out to determine the working conditions of KSM centrifugal pumps in high-viscosity cracking refuse. The conclusions, illustrated by graphs and tables, are summarized as follows: 1) when the viscosity increases, the output, head and efficiency of the pump fall, and the power consumption increases; 2) the performance of the pump depends largely on the state of the section between the inlet and outlet valves. The performance does not vary in direct proportion to the viscosity of the cracking refuse, as the latter absorbs heat from the disc friction, and thus loses some of its viscosity. V.I. Ashikhmin and E.V. Koval'skiy also took part in this work. There are 6 graphs, 1 diagram and 1 table.

1. Centrifugal pumps--Performance    2. Materials--Viscosity

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SOV/65-58-10-9/15

**AUTHORS:** Geller, Z. I. and Rastorguyev, Yu. L.

**TITLE:** Use of Regulating Conditions for Investigating the Thermal Conductivity of Petroleum Products (Primeneniye regul'yarnogo rezhima dlya issledovaniya teploprovodnosti nefteproduktov)

**PERIODICAL:** Khimiya i Tekhnologiya Topliv i Masel, 1958, Nr 10, pp 40 - 44 (USSR)

**ABSTRACT:** The coefficients of heat conductivity of petroleum products are required for calculating the heat exchange capacity of plants. These coefficients can be determined by methods which are based on the regularity of non-stationary temperature fields. The authors used the method of cooling developed by G. M. Kondrat'yev. A spherical bicalorimeter was used during these experiments. A detailed description of the apparatus itself (Fig.1) and of the bicalorimeter (Fig.2) is given. Special attention has to be paid to the placing of the tested product in the spherical space of the bicalorimeter as small quantities of air can lead to decreased values of heat conductivity coefficients (Fig.3). As standard liquids, distilled water and toluene were used. Experiments with water were carried out in

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SOV/65-58-10-9/15

Use of Regulating Conditions for Investigating the Thermal Conductivity of Petroleum Products

bicalorimeters with 2.05 and 4.09 mm spaces and at a temperature of the thermostat of  $30.6^{\circ}\text{C}$ . The maximum difference in temperature at the beginning of the experiment was 1.0 to  $1.6^{\circ}\text{C}$ . In bicalorimeters with 2.05 mm space, the average value for heat conductivity coefficients of water was  $0.529 \text{ cc} \cdot \text{cal} / \text{m} \cdot \text{hour}^{\circ}\text{C}$ . In bicalorimeters with 4.09 mm space at the same temperature, the average value was  $0.531 \text{ cc} \cdot \text{cal} / \text{m} \cdot \text{hour}^{\circ}\text{C}$ . Experiments for determining the heat conductivity of toluene at temperatures between  $30$  and  $80^{\circ}\text{C}$  were carried out in bicalorimeters with 1.03 mm space. The dependence of the heat conductivity coefficient on the apparatus used is shown in the form of a graph (Fig.4) where data obtained by N. B. Vargaftik is also given. Results are accurate within 2 to 3%. The method was used for the determination of the heat conductivity of lubricating oils and high vis-

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Use of Regulating Conditions for Investigating the Thermal Conductivity of Petroleum Products

osity cracking residues. Results of these experiments are also given in Fig.4. There are 4 Figures.

ASSOCIATION: Groznenskiy neftyanoy institut. (Groznyy Petroleum Institute)

Card 3/3

AUTHOR: Geller, Z.I. (Cand. Tech. Sci.)

SOV. 26-28-12-7/18

TITLE: Circulation heating of high-viscosity fuels in tanks (Tseirkulyatsionnyy podogrev vysokovyzkakh topliv v rezervuarakh)

PERIODICAL: Teploenergetika, 1958, No.12, pp. 37-44 (U.S.S.R.)

ABSTRACT: At present, the fuel oil in power station storage tanks is usually heated by steam coils or section heaters. The disadvantages of this method when applied to fuels are discussed. It is considered that the circulation method of heating very viscous fuel is a promising one. The principle is that fuel is drawn from the lower part of the tanks, pumped through an external heater and delivered to the bottom of the storage tank, either at the centre or at the opposite side from the intake. This process ensures mixing of the fuel and prevents deposit formation. The method is an old one, but has not been used much because it is rather complicated and requires large heaters. Formulas are then given for the design of a heating system of this kind. A general view of a circulation type fuel heating system in use at a Heat and Electric Power Station is reproduced in Fig.1. A schematic diagram in Fig.2, shows the location of the control and measuring instruments used to investigate the operating conditions of the system. A brief description of the equipment is given. Test results for different conditions of circulating heating and also for heating with steam coils, are given in a Table along with

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Circulation heating of high-viscosity fuels in tanks. SOV/96-58-12-7/18

characteristics of the fuels used. The rates of heat flow and the mean heat-transfer coefficients are much higher with circulation heating than with steam coil heating; other things being equal, the heating time can be cut by a factor of 1.7 - 4.3. The specific fuel consumption with circulation heating ranges from 785 to 942 kcal/ton<sup>26</sup>, according to the viscosity of the fuel. Of the total steam consumption, that of the circulation pump accounted for 40 - 63%, and considerable economy could be achieved by using exhaust steam from the pump for heating the fuel. The heat-exchanger which was used employed the principle of having one tube inside the other, and was very efficient, but the resistance to flow was high at high flow rates. The effect of this on steam consumption for pumping is considered when the exhaust steam from the pump is used for heating the oil. With circulation-type heating deposit formation in the tanks was much reduced, and heat losses from the tanks were also much less. The results of tests made with wet fuel oil, given in Fig. 5, show that circulation heating has some drying effect on the oil. Small steam bubbles are formed in the heater when wet fuel is circulated, and these expand on the line to the main tank. What happens subsequently in the main tank depends on conditions there; if the hydrostatic pressure of the oil in the tank is not too high, and the oil is not too cold the steam escapes. Some foaming was experienced at the top of the fuel tank when the moisture content of

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Circulation heating of high-viscosity fuels in tanks.      SOV/96-58-12-7/18

the oil was about 0.5%. The conditions that promote and discourage foam formation are described. To ensure safe operation when heating wet oil, it is necessary to consider the conditions under which it might be ejected from the tank. Analysis of the results of investigations by V.I. Blinov and G.N. Khudyakov show that when circulation heating is used, oil cannot be thrown out of the tank. This can, however, happen with surface-type heaters when the oil is raised above the boiling-point of water. There are 5 figures, 1 table and 7 references, 6 of which are Soviet.

ASSOCIATION: Gruzdevskiy Neftyanoy Institut (Gruzdevy Petroleum Institute)

Card 3/3

GELLER, Z.I., kand. tekhn. nauk

Cavitation characteristics of KSM pumps for high-viscosity  
cracking residues. Elek. sta. 29 no. 3: 19-22 Mr '58. (MIRA 11:5)  
(Centrifugal pumps) (Cavitation)

GELLER, Z.I., kand.tekhn.nauk

Processing fuel oil for electric power plants and industrial boiler  
units which are to be converted to high-viscosity fuel. Elek. sta.  
29 no.7:22-26 J1 '58. (MIRA 11:10)  
(Liquid fuels) (Boilers)

GELLER, Z. I. Doc Tech Sci -- (diss) "High-viscosity cracking residue as fuel."

[Mos], 1959. 42 pp (Mos Order of Lenin Power Engineering Inst), 160 copies.

List of author's works, pp 41-42 (28 titles). (KL, 41-59, 104)

GELLER, Zinovy Isayevich; MARTYNOVA, M.P., vedushchiy red.; TROFIMOV,  
A.V., tekhn.red.

[High-viscosity fuel oil for boilers and furnaces] Vysokoviskie  
mazuty kak kotel'noe i pechnoe toplivo. Moskva, Gos.nauchno-  
tekhn.isd-vo neft. i gorno-toplivnoi lit-ry, 1959. 215 p.  
(MIRA 13:2)

(Petroleum as fuel)

~~CELIER, Z.I.~~; MILOVA, N.A.; KOVAL'SKIY, Ye.V.

Evaporation and combustion of highly viscous cracking-  
residue droplets. Izv. vys. ucheb. zav.; neft' i gaz 2 no.6:  
73-78 '59. (MIRA 12:10)

1. Groznenskiy neftyanoy institut.  
(Cracking process)

24(8)

SOV/152-59-2-23/32

AUTHORS: Geller, Z. I., Rastorguyev, Yu. L.

TITLE: Dependence of Thermal Capacity of Petroleum Residues on Temperature (Zavisimost' teployemkosti neftyanykh ostatkov ot temperatury)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Neft' i gaz, 1959, Nr 2, pp 89 - 91 (USSR)

ABSTRACT: Relevant publications recommend the empirical formula developed by Fortch and Whitman (Refs 1 and 2) for the determination of the thermal capacity of petroleum products with specific weights between 0.75 - 1.00 g/cm<sup>3</sup>. Within the temperature range of 0-400°C the empirical formula developed by Kregg (Refs 1,2) is used for petroleum products with  $d_{15}^{15} = 0.72 - 0.96$ . For heating masuts formula VTI (Ref 3) is used to determine the thermal capacity. In order to make sure whether these formulas are applicable to the determination of the thermal capacity of petroleum residues from the Groznenskoye deposit, the thermal capacities of highly viscose

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Dependence of Thermal Capacity of Petroleum Residues  
on Temperature

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cracking residues and masuts were determined experimentally in the course of the investigation under review, and the data found were compared with those calculated by means of the formulas mentioned above. The experiments were carried out in a calorimetric plant (Fig 1). The comparison of experimental and theoretical data showed that Kregov's formula exhibits the lowest inaccuracy. The theoretical values for the thermal capacity deviate by no more than 2.5% from those found experimentally. There are 2 figures, 1 table and 5 Soviet references.

ASSOCIATION: Groznenskiy nefityanoy institut (Groznyy Petroleum Institute)

SUBMITTED: October 2, 1958

Card 2/2

GELLER, Z.I.; SUDAKOV, P.Ye.; RASTORGUYEV, Yu.L.

Measurement and control of the viscosity of petroleum products  
in the processing line. Khim. i tekhn. topl. i masel 4 no.3:  
13-16 Mr '59. (MIRA 12:4)

1. Groznenskiy neftyanoy institut.  
(Petroleum products) (Viscosimetry)

SOV/96-59-5-7/19

**AUTHOR:** Geller, Z.I., Candidate of Technical Sciences

**TITLE:** Selection of the Type of Heater for High-Viscosity Fuels  
(K voprosu o vybore tipa podogrevatelya dlya vysokovyazkikh topliv)

**PERIODICAL:** Teploenergetika, 1959. Nr 5. pp 38-45 (USSR)

**ABSTRACT:** Fuel oil is usually heated before burning by means of oil heater introduced by the Taganrog Boiler Works. This type has been produced for over 30 years without change of design, although the viscosity, solids content and asphalt content of heavy fuels has markedly increased during the period. The heaters are not very effective with heavy fuel because they rapidly become fouled on the fuel side and have small heating surface. The principal requirements in a heater for fuel oil are capacity and ease of cleaning. Various types of "tube-in-tube" heat exchangers have these attributes. One such type, intended for heating cracking residues, is illustrated in Fig 1. The cracking residue flows in an inner tube 59 mm diameter and 5100 mm long, while the heating steam flows in the annular space between the tubes. This type of heat exchanger was studied on the rig illustrated diagrammatically

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Selection of the Type of Heater for High-Viscosity Fuels

in Fig 2, one of the heat exchangers being used as a heater and the other serving as a cooler. The test equipment is described and its use explained. The properties of the high-viscosity cracking residue that was used in the tests are given in Table 1. The more important test results are presented in Table 2; they are thoroughly discussed in the text. The rate of heat transfer is much affected by the wall temperature, that is, by the viscosity of the liquid in the boundary layer. It will be seen from the results plotted in Fig 4, that the rate of heat transfer is considerably greater when the exchanger operates as a heater than when it is serving as a cooler. It will also be noticed that in the latter service the heat-transfer coefficient is less dependent upon the loading. The process of heat exchange in a heater is most accurately described by the criterial equation of M.A.Mikheyev: Fig 5 compares test data with values calculated by the Mikheyev's equation in the form of Eq (1). The criterial equation for calculating the coefficient of heat transfer between the surface of the

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