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AUTHOR: Polyakov, V. Ye. (Candidate of Technical Sciences; Docent)

ORG: Ural Politechnical Institute im. S. M. Kirov (Ural'skiy politekhnicheskii institut)

TITLE: Problems of self-tuning in relay protective equipment

SOURCE: IVUZ. Energetika, no. 12, 1966, 15-18

TOPIC TAGS: RC circuit, delay circuit

SUB CODE: 09

ABSTRACT: Self-tuning semiconductor voltage or current relays automatically change their firing characteristics with some delay in correspondence with a change in the parameter being controlled, or the mode of operation of the element being protected. This, plus the increase in the restoration coefficient to unity or higher, increases the sensitivity of these relays. The usage of self-tuning relays as starting organs in current maximum protective devices increases their sensitivity and expands the area of their application to voltages of 110 kv and higher, and also simplifies circuitry and increases reliability in case of damage to circuits in remote applications. A delay unit circuit may be constructed of passive RC circuits, the number being determined by the

Card 1/2

UDC: 621.316.925.1

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operating time of the protective device. Orig. art. has: 3 figures.

JPRS: 40,102

Card 2/2

POLYAKOV, V.Ye., kand. tekhn. nauk, dotsent; SKUTEL'NIKOV, V.I., inzh.

High-speed structural short-circuit protection system of generators, transformers, and generator-transformer units. Izv. vys. ucheb. zav.; energ. 8 no. 9:1-5 S '65. (MIRA 18:10)

1. Ural'skiy politekhnicheskiy institut imeni S.M. Kirova.
Predstavlena kafedroy elektricheskikh stantsiy, setey i sistem.

POLYAKOV, V.Ye., kand. tekhn. nauk, dotsent; SKUTEL'NIKOV, V.I., inzh.

Complex high-speed short-circuit protective relay of the main networks of electric power stations and substations. Izv. vys. ucheb. zav.; energ. 8 no.5:1-5 My '65. (MIRA 18:6)

1. Ural'skiy politekhnicheskiy institut imeni Kirova.
Predstavlena kafedroy elektricheskikh stantsiy, setey i sistem.

POLYAKOV, V.Ye., kand. tekhn. nauk, dotsent

Distance-type protection of electric power transmission lines
with branches. Izv. vys. ucheb. zav.; energ. 8 no.1:1-5 Ja '65.

(MIRA 18:2)

1. Ural'skiy politekhnichaskiy institut imeni S.M. Kirova.
Predstavlena kafedroy elektricheskikh stantsiy, setey i sistem.

POLYAKOV, V.Ye., kand.tekhn.nauk, dotsent; PROSKURIN, G.M., inzh.;
SKUTEL'NIKOV, V.I., inzh.

Application of the theory of switching circuits to problems of
power system control in courses of instruction. Izv. vys. ucheb.
zav.; energ. 7 no.3:19-25 Mr '64. (MIRA 17:4)

1. Ural'skiy politekhnicheskiy institut imeni S.M.Kirova.
Predstavlena kafedroy elektricheskikh stantsiy, setey i sistem.

POLYAKOV, V.Ye., kand.tekhn.nauk, dotsent

Self check of the operativeness of a.c. networks in the PZ-158 protection system. Izv. vys. ucheb. zav.; energ. 6 no.12:103-105 D '63.
(MIRA 17:1)

1. Ural'skiy politekhnicheskiy institut imeni Kirova. Predstavlena kafedroy elektricheskikh stantsiy, setey i sistem.

POLYAKOV, V.Ye., kand.tekhn.nauk, dotsent

Automatic reclosing of bus conductors with check of the presence
of permanent damage. Izv. vys. ucheb. zav.; energ. 6 no.7:
104-106 J1 '63. (MIRA 16:8)

1. Ural'skiy politekhnicheskiy institut imeni S.M.Kirova.
Predstavlena kafedroy elektricheskikh stantsiy, setey i sistem.
(Electric power distribution)

BAYAZITOV, M.S., inzh.; VERBENKO, O.A., inzh.; POLYAKOV, V.Ye., kand.-
tekh.nauk, dotsent

Distance-type PZ-152 protection system with a.c. operative current.
Izv. vys. ucheb. zav.; energ. 6 no.2:1-5 F '63. (MIRA 16:3)

1. Ural'skiy politekhnicheskiy institut imeni S.M.Kirova.
Predstavlena kafedroy elektricheskikh stantsiy, setey i sistem.
(Electric power distribution) (Electric protection)

POLYAKOV, V.Ye., kand.tekhn.nauk, dotsent

Some problems concerning the increase in the efficiency of automatic cutting-in of the auxiliary power supply in electric power systems. Izv.vys.ucheb.zav.; energ. 4 no.9:5-9 S '61. (MIRA 14:10)

1. Ural'skiy politekhnicheskiy institut imeni S.M.Kirova.
Predstavlena kafedroy elektricheskikh stantsiy, setey i sistem.
(Electric power distribution)

MECHEV, Yu.L., inzh.; POLYAKOV, V.Ye., kand.tekhn.nauk

Alternating current supply for filament networks of transmitter-receiver sets for high-frequency protective relay systems. Izv. vys. ucheb. zav.; energ. 3 no. 7:29-32 J1 '60. (MIRA 13:8)

1. Ural'skiy politekhnicheskiy institut imeni S.M. Kirova.
Predstavlena kafedroy elektricheskikh stantsiy, setey i sistem.
(Electric power supply to apparatus)
(Electric relays) (Electric protection)

KULIKOV, N.N.; POLYAKOV, V.Ye.

Polymer-gypsum made with phenolfurfurole resin. Stroi. mat. 6 no.11:
22 N '60. (MIRA 13:11)
(Gypsum)

KOVACHIK, I., inzh.; POLYAKOV, V.Ye., kand.tekhn.nauk

Contactless equipment for remote disconnections in relay protection
and automatic control of power systems. Izv.vys.ucheb.zav.; energ.
no.11:15-20 N'58. (MIRA 12:1)

1. Ural'skiy politekhnicheskiy institut imeni S.M. Kirova. Pred-
stavlena kafedroy elektricheskikh stantsiy, setey i sistem.
(Power engineering--Equipment and supplies)

BAYEV, A.V., dots., kand.tekhn.nauk; KRICHENOVA, I.A., kand.tekhn.nauk;
POLYAKOV, V.Ye., kand.tekhn.nauk; SIN'KOV, V.M., kand.tekhn.nauk;
SRODNYKH, V.Yu., inzh.

Experimental d.c. line between the Ural Polytechnical Institute and
the Ural Electric Apparatus Plant. Izv.vys.ucheb.zav.; energ.
no.10:144-145 0' 58. (MIRA 11:12)

1. Ural'skiy politekhnicheskiy institut imeni S.M. Kirova; Chelyabin-
skiy politekhnicheskiy institut; Institut avtomatiki Gosplana USSR.
(Ural Mountain region--Electric lines)

AUTHORS: Bayev, A. V., Krichenova, I. V., 105-58-6-30/33
Polyakov, V. Ye., Sin'kov, V. M., Srodnykh, V. Yu.

TITLE: On the Occasion of the 10-th Anniversary of Putting Into
Operation of the Test D.C. Line in the Town of Sverdlovsk
(K 10-letiyu so dnya puka eksperimental'noy linii postoyan-
nogo toka v g. Sverdlovske)

PERIODICAL: Elektrichestvo, 1958, Nr 6, pp. 93-93 (USSR)

ABSTRACT: On February 10, 1958 10 years had passed since the putting into
operation of the first small experimental line in the USSR. It
was constructed by the Ural Polytechnical Institute imeni S.M.
Kirov and the "Uralelektroapparat" factory. Its power was 180
kW at 12 kV. The a.c. voltage at the rectifier and inverter
substations was 6 kV. A number of scientific research works
were performed in this test line; in 1950 the line was demoun-
ted in connection with the new construction of the institute.

1. Transmission lines--USSR 2. Transmission lines--Equipment
3. Transmission lines--Performance

Card 1/1

POLYAKOV, V.Ye., dots., kand.tekhn.nauk

Complex utilization of radio relay lines for relay protection of electric transmission lines. Izv. vys. ucheb.zav.: energ. no.7: 1-7 J1 '58. (MIRA 11:10)

1. Ural'skiy politekhnicheskiy institut imeni S.M. Kirova.
(Radio relay systems)

POLYAKOV, V.Ye., kand. tekhn. nauk, dots.

Certain problems pertaining to the simplification of automatic
precise synchronization in power systems. Trudy Ural. politekh.
inst. no.90:142-145 '58. (MIRA 13:2)
(Electric power production)

POLYAKOV, V.Z. (Moskva)

Regularity and product of proximity spaces. Mat. sbor. 67
no.3:428-439 J1 '65. (MIRA 18:9)

POLYAKOV, V.Z. (Moskva)

Regularity of the product of regular proximity spaces. Mat. sbor. 68
no.2:242-250 O 1965. (MIRA 18:10)

POLYAKOV, V.Z.

Open mappings of proximity spaces. Dokl. AN SSSR 155 no. 5:
1014-1017 Ap '64. (MIRA 17:5)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.
Predstavleno akademikom P.S.Aleksandrovym.

POLYAKOV, Ya. F.

AMELIN, A.Z., polkovnik med. sluzhby, kand.med.nauk; POLYAKOV, Ya. F., podpolkovnik med.sluzhby; NIKITINA, N.I., mayor med.sluzhby.

Analysis of material on fatal outcomes in acute appendicitis. Voen.-
med.zhur. no.11:37-40 N '57. (MIRA 11:4)
(APPENDICITIS, statistics,
acute, fatality (Rus))

AMELIN, A.Z.; POLYAKOV, Ya.F.

Results of histological examinations of surgically removed appendices
vermiformes. Voen.-med.shur. no.6:34-36 Je '51. (MLRA 9:9)
(APPENDIX (ANATOMY))

POLYAKOV, Ya.F. (Tambov)

Pleural leiomyosarcoma with metastases. Arkh. pat. 26 no.5:73-75
'64. (MIRA 18:12)

1. Patologoanatomicheskoye otdeleniye Tambovskoy gorodskoy
bol'nitsy No.3 (glavnyy vrach N.I.Bukovskiy). Submitted
February 11, 1963.

POLYAKOV, Ya.G., redaktor; TIKHONOV, A.Ya.

[Water cooling in lining bearings with BT babbit; work practices in the Chelyabinsk Kirov plant] Vediance ekhlahdenie pri zalivke vkladyshei babbitom BT (Is opyta Cheliabinskogo Kirovskogo zavoda). Moskva, Gos. nauchno-tekhn.isd-vo mashinostroit. lit-ry, 1954. 7 p. (MIRA 8:5)

1. Moscow. Vsesoyuznyy preysktno-tekhnologicheskii institut (for Pelyakov).
(Chelyabinsk--Bearings (Machinery))

POLYAKOV, Ya.G., inzhener, redaktor; TIKHONOV, A. Ya., tekhnicheskii redaktor.

[Economizing ferromanganese during the smelting of open-hearth steel] Ekonomia ferromargantsa pri vyplavke martenovskoi stali. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. i sudostroit. lit-ry, 1954. 7 p. (MLRA 7:12)

1. Moscow. Vsesoyuznyy proyektno-tekhnologicheskii institut. (Manganese alloys) (Open-hearth process)

POLYAKOV, Ya.G., inzhener, redaktor; TIKHONOV, A.Ya, tekhnicheskij redaktor

[Efficient work cycles of electric smelting furnaces; from the practice of the Kirov Plant in Leningrad] Ratsional'nye rezhimy raboty elektroplyavil'nykh pechei; iz opyta leningradskogo Kirovskogo zavoda. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1954. 14 p. (MIRA 8:4)

1. Moscow. Vsesoyuznyy proyektno-tekhnologicheskij institut.
(Smelting furnaces) (Electric furnaces)

MYLKO, S.N., kandidat tekhnicheskikh nauk; RUBASHIN, F.F.; POLYAKOV,
Ya.G., inzhener, redaktor; TIKHONOV, A.Ya., tekhnicheskii redaktor.

[Stamping rollers for S-80 tractors from cast ingots] Shtampovka
rolikov traktora S-80 iz litykh zagotovok. Moskva, Gos.nauchn.-
tekh. izdvo mashinostroit. i sudostroit. lit-ry, 1954. 14 p.
(Moscow, Vsesoluznyi proektno-tekhnologicheskii institut. Obmen
tekhnicheskim opytom, no.12) (MLRA 9:8)
(Tractors) (Forging)

POLYAKOV, Ya.G., redaktor; UVAROVA, A.F., tekhnicheskiy redaktor

[Smelting bronze under a slag covering; work practices of the
Bryansk locomotive building plant] Plavka bronzy pod shlakovym
pokrovom; opyt Brianskogo parovozostroitel'nogo zavoda. Moskva,
Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1954. 15 p.
(MIRA 8:4)

1. Moscow. Vsesoyuznyy proyektno-tekhnologicheskiy institut.
(Bronze founding)

ROTENBERG, M.I.; MEL'NIKOVA, Ye.A.; POLYAKOV, Ya.G., inzhener, redaktor;
GOLOVIN, B.Ya., inzhener, redaktor; TIKHONOV, A.Ya., tekhnicheskii
redaktor.

[Mastering the casting of crankshafts from spheroidal graphite iron]
Osvoenie otlivki kolenchatykh valov iz chuguna so sferoidal'ny
grafitom. Moskva, Gos.nauchno.-tekhn. izd-vo mashinostroit. i
sudostroit. lit-ry, 1954. 16 p. (Moscow. Vsesoiuznyi proektno-tekhn-
nologicheskii institut. Obmen tekhnicheskim opytom, no.13)
(MLRA 9:8)

(Crankshafts) (Founding)

POLYAKOV, Ya.G., inzhener, redaktor; TIKHONOV, A.Ya., tekhnicheskiy
redaktor

[Physicochemical action recuperator for heating the cupola furnace
blast; experience of the Syzran' Hydraulic Turbine Plant] Rekuperator
fiziko-khimicheskogo deistviia dlia podogreva vagramochnogo dut'ia;
opyt Syzranskogo gidroturbinnogo zavoda. Moskva, Gos. nauchno-tekhn.
izd-vo mashinostroit. lit-ry, 1954. 17 p. (MLRA 8:4)

1. Moscow. Vsesoyuznyy proyektno-tekhnologicheskii insitut.
(Cupola furnaces)

POLYAKOV, Ya. G., inzhener, redaktor; TIKHONOV, A.Ya., tekhnicheskiy
redaktor

[Methods of increasing resistance to wear in cast iron products]
Puti povysheniia iznosostoikosti chugunnykh detalei. Moskva, Gos.
nauchno-tekhn. iss-vo mashinostroit. i sudostroit. lit-ry, 1954.
27 p. (MLRA 7:10)

1. Moscow. Vsesoyuznyy proyektno-tekhnologicheskiy institut.
Otdel tekhnicheskoy informatsii
(Cast iron)

POLYAKOV Ya.G.

POLYAKOV, Ya.G., inzhener, redaktor; TIKHONOV, A.Ya., tekhnicheskii

[Better utilization of smelting and steel heating furnaces]
Uluchshenie ispol'zovaniia staleplavil'nykh i nagrevatel'nykh pechei
Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. i sudostroit. lit-
ry. No.3. 1954. 34 p. (MLRA 8:4)

1. Moscow. Vsesoyuznyy proyektno-tekhnologicheskii institut.
(Metallurgical furnaces)

POLYAKOV, Ya. G., inzhener, redaktor; TIKHONOV, A. Ya., tekhnicheskiy redaktor.

[Precision casting in building transportation and heavy machinery]
Tochnoe lit'e v transportnom i tiazhelom mashinostroyenii. Moskva
Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1954 155 p.
(MLRA 8:8)

1. Moscow, Vsesoyuznyy proyektno-tekhnologicheskii institut.
Otdel tekhnicheskoy informatsii.
(Precision casting)

POLYAKOV, Yakov Grigor'evich; SHESTOPAL, Viktor Mikhaylevich; ISLANKINA
T.F., redaktor; GUBIN, M.I., tekhnicheskii redaktor.

[Development of cast iron production] Puti razvitiia tekhniki
chugunoliteinogo proizvodstva. Moskva, Izd-vo "Znanie," 1957.
31 p. (Vsesoiuznoe obshchestvo po rasprostraneniuiu politicheskikh
i nauchaykh znani. Ser.4, no.6)[Microfilm] (MLRA 10:6)
(Cast iron)

SOV/128-59-10-21/24

18(5)

AUTHOR:

Polyakov, Ya.G.

TITLE:

Problems on the Development of Foundry Production in the GDR

PERIODICAL:

Liteynoye proizvodstvo, 1959, Nr 10, pp 46-48 (USSR)

ABSTRACT:

The author presents detailed statistic data on all fields of foundry production in the GDR, taken from the periodical "Gicsserei-technik". There are 1 table and 5 German references.

Card 1/1

POLYAKOV, Ya.G.

Modern trends in casting technology abroad. Lit. proizv. no.4:
44-48 Ap '64. (MIRA 18:7)

POLYAKOV, Ya.G.

Plastics and synthetic resins in modern pattern production abroad.
Lit. proizv. no.6:44-48 Je '64.

(MIRA 18:5)

POLYAKOV, Ya.G.

Plastics and synthetic resins in modern pattern manufacture abroad.
Lit.proizv. no.7:48,3 of cover J1 '64.

(MIRA 18:4)

POLYAKOV, Ya.G., inzh.

Modern trends in foreign foundry technology. Lit. proizv. 5:
44-48 My '64. (MIRA 18:3)

POLYAKOV, Ya.G., inzh., red.; TIKHONOV, A.Ya., tekhn. red.

[Mastering the founding of crankshafts from cast iron with spheroidal graphite] Osvoenie otlivki kolenchatykh valov iz chuguna so sferoidal'nym grafitom; opyt Kolomenskogo parovozostroitel'nogo zavoda im. Kuibysheva. Moskva, Mashgiz, 1954. 15 p. (Obmen tekhnicheskim opytom, no.13)
(MIRA 16:11)

1. Moscow. Vsesoyuznyy proyektno-tekhnologicheskii institut.
(Iron founding) (Cranks and crankshafts)

POLYAKOV, Ya.G.

Use of molding materials in foundries. *Biul.tekh.-ekon.inform.-*
Gos.nauch.-issl.inst.nauch.i tekhn.inform. 16 no.4:80-83 '63.
(MIRA 16:8)

(Foundries--Equipment and supplies)

POLYAKOV, Ya.G.; ALEKSEYEVSKAYA, Ye.A., red.; KOVAL'SKAYA, I.F.,
tekhn. red.

[Automation and automatic machine lines in founding] Avto-
matizatsiia i avtomaticheskie mashinnye linii v liteinom
proizvodstve; obzor. Moskva, TSINTIMASH, 1961. 97 p.
(MIRA 16:5)

(Founding) (Automatic control)

POLYAKOV, Ya.G.

Modern trends in foundry practice abroad. Lit.proizv. no.7:45-
48 J1 '62. (MIRA 16:2)

(Founding)

POLYAKOV, Ya. G.

Modern trends in foreign foundry practices. Lit. proizv.
no.10:45-48 0 '62. (MIRA 15:10)

(Founding)

DOSHKARZH, I. [Doskar, Josef], inzh. doktor; VALIKHRAKH, O. [Valihrach, Otakar], inzh.; GABRIYEL', Ya. [Gabriel, Jan]; KASHTANEK, O. [Kastanek, Otakar]; ZHUKOV, A.A. [translator]; EMINGER, Z., doktor nauk, retsenzent; POLYAKOV, Ya.G., red.; KRAUS, O., glav. red.; SIROTIN, A.I., red. 1zd-va; EL'KING, V.D., tekhn. red.

[Precision casting in ceramic molds] Tochnoe lit'e v keramicheskie formy. Pod red. IA.G. Poliakova. Moskva, Mashgiz, 1962.
295 p. (MIRA 16:2)

(Precision casting)

POLYAKOV, Y.G.

Cupola process abroad. Biul.tekh.-ekon.inform.Gos.nauch.-issl.inst.-
nauch. i tekh.inform. no.8:92-96 '62. (MIRA 15:7)
(Cupola' furnaces)

POLYAKOV, Ya.G.

Foundry practice in India. Lit.proizv. no.2:46-47 F '62.
(MIRA 15:2)

(India--Founding)

POLYAKOV, Ya.G.

Modern solutions arrived at in foreign countries in founding in
shell molds. Lit. proizv. no. 4:45-48 Ap '61. (MIRA 14:4)
(Shell molding (Founding))

POLYAKOV, Ya.G.

Making spheroidal iron and malleable iron castings. Lit. proizv.
no. 5:48 My '61. (MIRA 14:5)
(United States—Iron founding)

POLYAKOV, Ya.G.

Ways of solving certain problems in the CO_2 process. Lit. proizv.
no.6:45-48 Je '61. (MIRA 14:6)

(Coremaking)

POLYAKOV, Ya.G.

New Swiss foundry. Lit. proizv. no. 2:47-48 F '61. (MIRA 14:4)
(Switzerland—Foundries)

S/128/60/000/007/017/017/XX
A105/A033

AUTHOR: Polyakov, Ya.G.

TITLE: Normalization of Surface Finish of Castings

PERIODICAL: Liteynoye proizvodstvo, 1960, No. 7, pp. 44-46

TEXT: The author discusses the absence of practical standards on surface finish of castings in all industrial countries and mentions the Soviet standard ГОСТ 2789-51 (GOST 2789-51) and Czechoslovakian standard TSN 014450. The article states further that US military aircraft construction experts are working on the development of a suitable method of standardization. A special work "Investigation of Methods to Determine the Surfaces Roughness of Castings" was carried out in 1958 by the foundry department of Scientific Research Institute of Materials and Technology in Brno, CSR. A brief description of the US method based on the military standard MIL-STD-10A is given. Research on standards giving an accurate evaluation of surface roughness was the subject of experiments carried out by the Czechoslovakian Institute. Experiments were carried out on grey iron bars cast into green sand molds of

Card 1/5

S/128/60/000/007/017/017/XX
A105/A033

Normalization of Surface Finish of Castings

synthetic materials, i.e., quartz sand and bentonite, clay and water glass. Specimens of varying degrees of surface roughness were subjected to control checks. The TSN 014450 standard lays down three numerical roughness criteria: mean arithmetic deviation from the medium line of section R_a profile; roughness height R_z , being the mean distance between five highest and lowest profile points; maximum height R_z , the vertical distance between the highest and the lowest point of roughness. Value R_z was selected as the most suitable for the determination of the surfaces roughness of castings. The specimens were examined under a Reichert microscope and subjected to check according to the Schmaltz method. The maximum measuring error is assumed as $\pm 15\%$ for rough surfaces, $\pm 25\%$ for surfaces with $50 \mu R_z$ and $\pm 30-35\%$ for $50-100 \mu R_z$. The measuring results showed (Table 1) a satisfactory coincidence with the ordinary value series according to the standard CSN-014450 which permitted the classification into 10 surface finish standards. A brief measuring manual is given. In cast iron production four of these standards are sufficient. These and three standards for finishes below $R_z = 25 \mu$ and one $R_z = 400 \mu$ will meet the requirements regarding all known alloys as shown in Table 2. The Czechoslovakian Institute which aims at a more accurate graduation of surface finishes than that recommended by USA, will continue its research in 1960 and 1961. There are 2 tables and 2 references: 1 Soviet and 1 non-Soviet.

Card 2/5

S/128/60/000/007/017/017/XX
A105/A033

Normalization of Surface Finish of Castings

Table 1:

- 1) R_z Values of the Main Gage Set
- 2) Height of roughness R_z in according to the CSN 014450 standard
 - a) basic series
 - b) practical series
- 3) Mean values R_z in
 - a) measured in microsections
 - b) measured with microscope
- 4) Class of roughness (gages)

1) Величины R_z у основного комплекта эталонов

2) Высота неровностей R_z в мкм по стандарту CSN 014450		3) Средние величины R_z в мкм замеренные		4) Класс шероховатости (этапоны)
а) Основной ряд	б) Практический ряд	а) По шапкам	б) Оптическим методом	
25	25	25,9	23,1	1
32	—	33,4	74,5	2
—	—	21,7	53,4	3
50	50	40,1	60,6	4
65	—	64,0	72,0	5
80	—	85,0	91,6	6
100	100	99,2	109,6	7
125	—	125,0	132,0	8
160	—	140,8	137,4	9
200	200	153,5	—	10

Card 3/5

Normalization of Surface Finish of Castings

S/128/60/000/007/017/017/XX
A105/A033

Table 2:

1) Возможная классификация шероховатости этих поверхностей

2) Высота неровностей по станинату в мк	3) Кошпакет атадо-нов, припаяемых для иссакова-тальских цехей	4) Проектирова-ние компект атадо-нов	5) Способ сравнения с эталоном	6) Приметные области исполь-зования
2,0 2,5 3,2			МК*	Литье под давлением Литье по выплавочным формам Литье в сухие песчаные окрасочные формы
4,0 5,0 6,3		1 2	МК	
8,0 10,0 12,5		3	МК	
16 20 25		4 5	МК МК НП	Литье в песчаные окрасочные формы Средний путь
32 40 50		2 3 4	МК Н НП	
63 80 100		5 6 7	МК Н НП	Литье по выплавочным формам Литье в сухие песчаные окрасочные формы Средний путь
125 160 200		8 9 10	НП	
250 320 400		11	НП	

13) Стаб
14) Средний путь
15) Литье по выплавочным формам
16) Литье в сухие песчаные окрасочные формы
17) Литье под давлением
18) Литье по выплавочным формам
19) Литье в сухие песчаные окрасочные формы
20) Литье по выплавочным формам

14) Микроскоп-сцинтиллятор
15) Нейтронный гамма-спектрометр

Card 4/5

Normalization of Surface Finish of Castings

S/128/60/000/007/017/017/XX
A105/A033

Table 2 continued:

- 1) Possible Classification of the Surface Roughness of Castings
- 2) Height of roughness in μ according to standard
 - a) basic series
 - b) practical series
- 3) Set of gages being used for research purposes
- 4) Set of gages being projected
- 5) Method of comparison with gage
- 6) Exemplary field of utilization
- 7) Pressure casting
- 8) Light alloys
- 9) Castings in non-pointed sand molds
- 10) Dispensable pattern casting
- 11) gray cast iron
- 12) Casting in pointed dry sand molds
- 13) Steel



Card 5/5

AKSENOV, P.N.; BERG, P.P.; GODASHKOV, N.M.; VEYNIK, A.I.; GORSHKOV, A.A.;
ZHAROV, N.T.; ZHUKOV, A.A.; ZOROKHOVICH, I.Z.; KUMANIN, I.B.;
LEVI, L.I.; LYASS, A.M.; MARIYENBAKH, L.M.; ORLOV, G.M.; PORUCHI-
KOV, Yu.P.; RABINOVICH, B.V.; STOLBOVOY, S.Z.; FEYGEL'SON, B.Yu.;
VASILEVSKIY, P.F., red.; KLOCHNEV, N.I., red.; KONSTANTINOV, L.S.,
red.; POLYAKOV, Ya.G., red.; MARKIZ, Yu.L., red. izd-va; UVAROVA,
A.F., tekhn. red.

[Theory of founding processes] Voprosy teorii liteynykh protsessov.
Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1960. 692 p.
(MIRA 13:7)

(Founding)

PHASE I BOOK EXPLOITATION

SOV/4996

Polyakov, Yakov Grigor'yevich

Sovremennaya tekhnologiya i oborudovaniye protsessov polucheniya tochnykh otlivok (Modern Precision-Casting Equipment and Processes) Moscow [VINITI] 1959. 82 p. Errata slip inserted. 1,000 copies printed.

Sponsoring Agencies: Gosudarstvennyy nauchno-tekhnicheskiy komitet Soveta Ministrov SSSR, Akademiya nauk SSSR, and Vsesoyuznyy institut nauchnoy i tekhnicheskoy informatsii.

Ed.: M. K. Morozova; Tech. Ed.: P. N. Gavrin.

PURPOSE: This booklet is intended for technical personnel in foundries.

COVERAGE: The author discusses processes for the production of castings by using single-casting and permanent molds. He outlines the Osborn-Shaw (English) method for making precision castings from any founding alloys in refractory molds and the "Antioch" method developed by Morris Bean and Company (USA) for plaster casting. Shell molds and investment casting are discussed and the latest methods in chill casting and die casting are

Card 1/3

POLYAKOV, Ya.G. [translator]; FEYGEL'SON, B.Yu. [translator]; STEPANCHENKO, N.S., red.izd-va; TIKHANOV, A.Ya., tekhn.red.

[Papers of the 24th International Foundry Congress] 24-i Mezhdunarodnyi kongress liteishchikov 19-24 avgusta 1957 g. v Stokgol'me; doklady. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1960. 479 p. (MIRA 14:1)

1. International Foundry Congress. 24th, Stockholm, 1957. (Founding--Congresses)

POLYAKOV, Ya.G.

Standardizing the finish (smoothness) of cast surfaces. Lit.proizv.
no.7:44-46 Jo '60. (MIRA 13:7)
(Steel--Metallurgy) (Desulfuration)

POLYAKOV, Ya.G.

Standardizing the finish (smoothness) of cast surfaces. Lit.
proizv. no.7:44-46 Je '60. (MIRA 13.7)
(Foundries--Quality control)

POLYAKOV, Ya.G.; MOROZOVA, M.K., red.; GAVRIN, P.N., tekhn.red.

[Modern techniques and equipment for precision casting] Sovremennaya tekhnologiya i oborudovanie protsessov polucheniia tekhnicheskikh otlivok. Moskva, Vses.in-t nauchn. i tekhn.informatsii, 1959. 82 p. (MIRA 13:10)

(Precision casting)

SOV/128-59-11-22/24

18 (5)

AUTHOR: Polyakov, Ya. G., Engineer

TITLE: Modern Problems of Cupola Melting and Their Solution
Abroad

PERIODICAL: Liteynoye proizvodstvo, 1959, Nr 11, pp 44-48 (USSR)

ABSTRACT: This article deals with the methods of cupola melting in different countries outside the Soviet Union. Of the countries behind the Iron Curtain only Czechoslovakia is mentioned. The author states that in this country only 1% of cupolas are provided with a hot blast. He describes a recuperator utilizing cupola gases which is installed at the Plant imeni Stalin in Martin. The recuperator is installed on a cupola with an inside diameter of 90 cm; the cupola is provided with 3 rows of tuyeres and lined with refractory clay. The coke consumption was cut down from 15% (cold blast) to 11% (hot blast); the temperature of cast iron was raised from 1325°C to 1340°C. Further, the author describes the modern pro-

Card 1/2

SOV/128-59-11-22/24

Modern Problems of Cupola Melting and Their Solution Abroad

cesses of cupola melting used in the USA, England, Canada, France, Italy and G.F.R. There are 15 references, 10 of which are English, 2 German, 1 French, 1 Italian and 1 Czech.

Card 2/2

18(5)

SOV/128-59-4-14/27

AUTHOR: Polyakov, Ya.G., Engineer

TITLE: Supersonic Control of Castings

PERIODICAL: Liteynoye Proizvodstvo, 1959, Nr 4, pp 32-34 (USSR)

ABSTRACT: This article is based entirely on English material.
There are 5 diagrams and 2 photographs.

Card 1/1

POLYAKOV, Yakov Grigor'yevich; SUDAKIN, Ya.A., inzh., red.; SOBOLEVA, G.N.,
red. izd-va.; TIKHANOV, A.Ya., tekhn. red.

[Founding abroad] Liteinoe proizvodstvo za rubezhom. Moskva, Gos.
nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1958. 250 p.

(MIRA 11:12)

(Founding)

POLKAKOV, Ya.G.

Model equipment made of epoxy resins (from foreign practices).
Lit.proizv. no.9:25-29 S '58. (MIRA 11:10)
(Foundry machinery and supplies)
(Resins, Synthetic)

LAKEDEMONSKIY, A.V.; PROSYANIK, G.V.; SOKOV, M.K.; POLYAKOV, Ya.G., red.

[Technology of shell molding; principles of the technological process and the materials] Tekhnologiya lit'ia v obolochkovye formy osnovy tekhnologicheskogo protsessa i materialy. Moskva, 1957. 30 p. (Peredovoi opyt proizvodstva. Seriya "Mashinostroenie," no.3). (MIRA 11:7)

(Shell molding (Founding))

AUTHOR: Polyakov, Ya.G. SOV-128-58-9-13/16

TITLE: Model Equipment from Epoxide Resins (Foreign Experience)
[Model'naya osnastka iz epoksidnykh smol (zarubezhnyy opyt)]

PERIODICAL: Liteynoye proizvodstvo, 1958, Nr 9, pp 25-29 (USSR)

ABSTRACT: The article contains abstracts from the journals "Foundry", "Modern Castings", "Giessereitechnik", "Engineer and Foundryman", "Automotive Industry", and "Giesserei". There are 2 photos and 7 non-Soviet references.

1. Resins--Applications 2. Industry--USSR 3. Periodicals--USSR

Card 1/1

POLYAKOV, Ya.M.; ZAMESOVA, G.Z.

Tantalum deposition from a vapor-gaseous phase. Izv. vys.
ucheb. zav.; tsvet. met. 7 no. 4:130-134 '64 (MIRA 19:1)

ACCESSION NR: AP4024771

S/0080/64/037/003/0669/0672

AUTHOR: Nisel'son, L. A.; Polyakov, Ya. M.; Krestovnikov, A. N.

TITLE: Research on the process of niobium extraction by reduction of NbCl₅ by hydrogen. II Communication II

SOURCE: Zhurnal prikladnoy khimii, v. 37, no. 3, 1964, 669-672

TOPIC TAGS: niobium extraction, reduction, NbCl₅, TaCl₅, equilibrium constant, NbCl₅ reduction

ABSTRACT: From an earlier work (Ya. M. Polyakov, L. A. Nisel'son, A. N. Krestovnikov, ZhPKh, XXXVI, 1, 25 (1963)), it follows that the reduction of NbCl₅ with hydrogen occurs more easily and at lower temperatures than the reduction of TaCl₅. From the data of temperature dependence of the equilibrium constant (Kp) of the reaction equilibrium yields (Fig. 1) and degrees of conversion of



Card 1/5

ACCESSION NR: AP4024771

NbCl₅ into metal (Fig. 2) for various temperatures and NbCl₅ concentrations in the initial vapor-gaseous mixtures were computed. The data obtained makes it possible to estimate the temperature and concentration limits within which optimum operating conditions of the process can be created in industrial equipment, namely: 0.1-0.2 of niobium pentachloride mole in 1 mole of vapor-gaseous mixture and 1000-1300 C. In these conditions the rate of niobium precipitation was 0.7-1.5 g/cm². hr. with a yield of 1.5-3.2 g. of niobium in 1 mole of the mixture; degrees of conversion of niobium pentachloride into metal are 15-30% and specific consumption of electric power is 17-22 kw. hr. in one kg. of niobium (Fig. 3). It should be noted that the indexes mentioned above are not optimum and can be increased by taking into account the variation of the vapor-gaseous flow rate and apparatus design. "Graduate K. V. Tret'yakova took part in the experiment". Orig. art. has: 1 table, 5 figures.

ASSOCIATION: None

SUBMITTED: 28Dec62

DATE ACQ: 16Apr64

ENCL: 03

SUB CODE: GC

NO REF SOV: 001

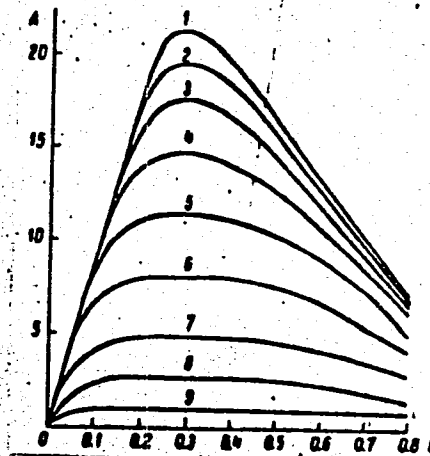
OTHER: 000

Card. 1/5

ACCESSION NR: AP4024771

ENCLOSURE: 01

Fig. 1 - Dependence of equilibrium yield of niobium (A, g/mole of mixture) on initial concentration of niobium pentachloride (B, mole/mole of mixture) in vapor-gaseous mixture $NbCl_5$ + H_2 and on temperature. Temperature ($^{\circ}K$): 1 - 1500, 2 - 1400, 3 - 1300, 4 - 1200, 5 - 1100, 6 - 1000, 7 - 900, 8 - 800, 9 - 700.

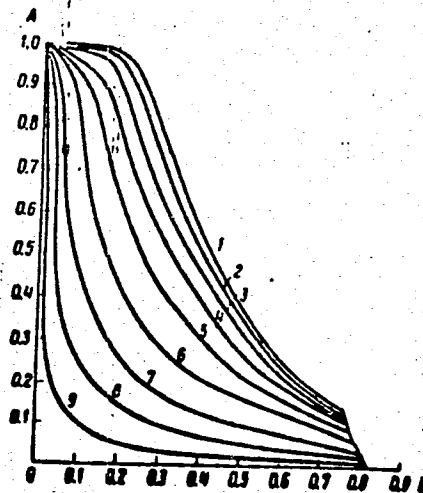


Card 3/5

ACCESSION NR: AP4024771

ENCLOSURE: 02

Fig. 2 - Dependence of equilibrium degree of conversion of niobium pentachloride into metal, on initial concentration of niobium pentachloride in vapor-gaseous mixture of $NbCl_5$ / H_2 and on temperature. Symbols are the same as in Fig. 1

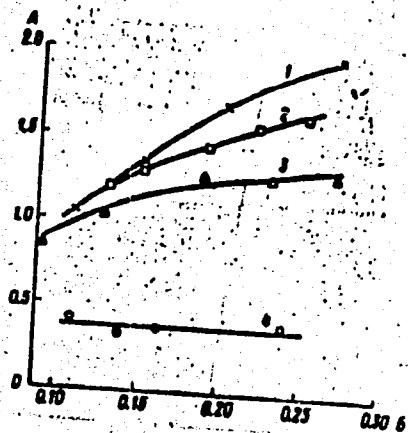


Card 4/5

ACCESSION NR: AP4024771

ENCLOSURE: 03

Fig. 3 - Dependence of specific electric energy consumption (A, kw. hr./kg.Nb) on temperature (B, °C) and concentration of niobium pentachloride in vapor-gaseous mixture NbCl₅ / H₂. Content NbCl₅ (mole): 1 - 0.1, 2 - 0.15, 3 - 0.20.



Card 5/5

POLYAKOV, Ya.M.; NISEL'SON, L.A.; KRESTOVNIKOV, A.N.

Process for producing tantalum and niobium by the reduction of their pentachlorides with hydrogen (reduction of $TaCl_5$). Zhur.prikl.khim. 36 no.1:25-33 Ja '63. (MIRA 16:5)

(Tantalum) (Niobium)

L 07379-67 EWT(m)/EWP(t)/ETI IJP(c) JD/JG

ACC NR: AP6027754

(A)

SOURCE CODE: UR/0370/66/000/004/0167/0169

AUTHOR: Polyakov, Ya. M. (Moscow); Adler, Yu. P. (Moscow); Nisel'son, L. A. (Moscow)

ORG: None

TITLE: Use of the method of mathematical planning of experiments for studying the process of tantalum production by hydrogen reduction of tantalum pentachloride on a heated surface

36
B

SOURCE: AN SSSR. Izvestiya. Metally, no. 4, 1966, 167-169

TOPIC TAGS: tantalum, tantalum compound, chemical reduction, chloride

ABSTRACT: It is shown that the mathematical method for planning experiments (Nalimov, V. V., "Statistical methods for describing chemical and metallurgical processes", Metallurgizdat, 1963) may be used in determining optimum conditions for production of tantalum from the pentachloride. Rectified tantalum pentachloride was used containing 0.15-0.2% Nb, 0.02-0.04% Fe, <0.01% Ti, <0.01% Si, <0.005% W and <0.005% Mo (metals to chloride) and hydrogen purified in an installation consisting of tanks with silicagel, chromium-nickel catalyst and activated carbon. The experiments were done in a reactor 120 mm in diameter and 270 mm high. The tantalum was precipitated on a tape 0.2 mm thick and 885 mm long. The duration of the experiments was one hour. The following factors were selected: tape temperature--X₁, rate of hydrogen feed--X₂, rate of tantalum pentachloride feed--X₃ and the width (surface dimensions) of the tape--X₄. The factors taken as criteria of optimality were the rate of precipitation (productivity)

Card 1/2

POLYAKOV, Ye.A.

Transportation problems of Magadan Province. Vop. geog. no.61:
143-152 '63. (MIRA 16:6)

(Magadan Province--Transportation)

BARYGIN, D.A.; POLYAKOV, Ye.A.

How we are achieving higher output of woodpulp per cubic meter of digester. Bum. prom. 36 no.7:17-18 J1 '61. (MIRA 14:9)

1. Glavnyy inzh. pervogo Kaliningradskogo kombinata (for Barygin).
2. Smennyy master kislotnovarochnogo tsekha pervogo Kaliningradskogo kombinata (for Polyakov).
(Woodpulp) (Autoclaves)

POLYAKOV, Ye.I.

Axially symmetric free turbulent jets. Sbor.trud.NIIST
no.9:166-184 '61.

(Turbulence)

(MIRA 15:8)

84734

S/057/60/030/010/014/019
B013/B063

10-2000 2207, 2310, 2615 only

AUTHOR: Polyakov, Ye. I.

TITLE: Experimental Study of Axisymmetric Turbulent Jets

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 10,
pp. 1238 - 1244

TEXT: The basic forms of axisymmetric, incompressible, free, turbulent jets were experimentally studied on a special pressure-testing apparatus. Basic experiments were carried out at initial velocities of the order of 45 - 55 m/sec. Inhomogeneities of the initial velocity field were arbitrarily produced to study the jet propagation as a function of the initial conditions. Fig. 1 shows the velocity fields in the initial cross section of the jets under consideration. Fig. 2 shows the velocity fields in several cross sections of the jets for different irregularities of the initial velocity profile. The author used an orthogonal coordinate system which is very convenient for practical purposes. In this system, the axis of abscissas coincides with the axis of symmetry of the jet, and the origin of coordinates is in the center of the outlet. When assuming a

Card 1/3

84734

Experimental Study of Axisymmetric Turbulent Jets S/057/60/030/010/014/019
B013/B063

constant angle for the turbulent propagation and using the theorem of conservation of momentum, the velocity change along the jet axis as a function of the cross-sectional abscissa may be easily found:
 $W_m = S(\sqrt{E_0}/x)$; $E_0 = I_0/\rho$ is the kinematic jet pulse. The value of the constant S calculated from experimental results amounts to 7.38, and formula (2a) has the form $W_m = 7.38(\sqrt{E_0}/x)$. The curve drawn from this formula is in good agreement with the results of measurement (Fig. 3). Several values of the coefficient $W_m d_0/\sqrt{E_0}$ are given in a table for various initial profiles. When taking the kinematic pulse as the determining parameter, simple relations are obtained for the calculation of other characteristics of the jet. The same apparatus was used to produce a fan-shaped jet. Fig. 4 shows the field of relative velocities in the main part of the fan-shaped jet. A formula was derived for the axial velocity (7): $W_m = \sqrt{E_0}/\sqrt{x(x + R_0)}$. Here, x denotes the distance between the opening and the cross section investigated; R_0 is the radius of the opening; and E_0 is the kinematic jet pulse. This formula agrees

Card 2/3

POLYAKOV, Ya. I.

POLYAKOV, Ya. I. -- "Presentation and Unity of Entire Functions of the Finite Order." Sub 2 Apr 52, Sci Res Inst of Mechanics and Mathematics, Moscow (rder of Lenin State U. imeni M. V. Lomonosov. (Dissertation for the Degree of Candidate in Physicomathematical Sciences).

SO: Vecherniya Moskva January-December 1952

POLYAKOV, YA. I.

Defended his Candidates dissertation in the Mechanics and Mathematics Faculty of Moscow State University on 2 June 1952.

Dissertation: "On the Representation and Uniqueness of Entire Functions of Finite Order."

SO: Vestnik Moskovskogo Universiteta, Seriya Fiziko-Matematicheskikh i Yestestvennykh Nauk, No. 1, Moscow, Feb. 1953, pp 151-157: transl. in W-29782, 12 April 54, For off. use only.

POLYAKOV, Ye., kand.tekhn.nauk

Reference book for the housing worker ("Rules and standards
for housing operation") Reviewed by E. Poliakov. Zhil.-
kom. khoz. ll no.8:34 Ag '61. (MIRA 14:9)
(Housing management--Standards)

POLYAKOV, Ye.M., inzh.

Causes for cable breakdown on the slope of the No.1-2 "Gorskaia"
Mine. Bez.truda v prom. 6 no.1:11 Ja '62. (MIRA 15:1)

1. Upravleniye Luganskogo okruga Gosgortekhnadzora USSR.
(Lugansk Province--Mine accidents)

POLYAKOV, Ye.M., insh.; TKACHENKO, V.A., insh.

Establish contours of old flooded workings exactly.
Bezop.truda v prom. 4 no.7:11 JI '60.

(MIRA 13:8)

(Mining engineering)

L 17 328-65 EWT(m)/EPF(n)-2/EWP(t)/EWP(b) Pu-4 IJP(c)/ASD(m)-3/ASD(f)-2 JD/
JG
ACCESSION NR: AP4047493 S/0149/64/000/004/0130/0134

AUTHOR: Polyakov, Ya. M.; Zamesova, G. Z.

TITLE: On the problem of tantalum deposition from vapor-gas phase ¹⁵

SOURCE: IVUZ. Tsvetnaya metallurgiya, no. 4, 1964, 130-134

TOPIC TAGS: tantalum extraction, tantalum vapor extraction,
tantalum, tantalum pentachloride, tantalum pentachloride reduction

ABSTRACT: A series of experiments with vapor deposition of tantalum were performed in order to determine the basic conditions of the process. Tantalum pentachloride was evaporated into a stream of dry hydrogen and reduced to tantalum which condensed the outside surface of a nickel tube maintained at 650—1330C. The thickness of deposits obtained varied with the temperature of the tube, and the deposition rates varied from 50 μ deposited in 10 min at 650C to 250 μ deposited in 20 min at 1170 1170C. Deposits obtained at 650C consisting only of tantalum were brittle and could be easily removed from the substrate. Deposits obtained at 800C also contained tantalum hydrides, and those obtained at

Card 1/2

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ACCESSION NR: AP4047493

900C and above contained tantalum hydrides and a tantalum-nickel solid solution. The latter deposit adhered tightly to the substrate, forming a diffusion zone. Vacuum outgassing of deposits at 800C eliminated all of the gases and the nickel. The degassed deposits contained 0.409-0.715% impurities, including 0.2--0.5% niobium. Orig. art. has: 4 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: MM, CC

NO REF SOV: 000

OTHER: 001

Card 2/2

ACCESSION NR: AP4017567

S/0149/64/000/001/0131/0138

AUTHOR: Polyakov, Ya. M.; Nisel'son, L. A.; Krestovnikov, A. N.

TITLE: Preparation of niobium and tantalum from the vapor phase

SOURCE: IVUZ. Tsvetnaya metallurgiya, no. 1, 1964, 131-138

TOPIC TAGS: niobium, tantalum, niobium production, tantalum production, niobium coating, tantalum coating, vapor phase plating, niobium alloy, tantalum alloy

ABSTRACT: The following conclusions resulted from a review of Soviet and Western work on the preparation of niobium and tantalum from the vapor phase. The production of niobium and tantalum coatings, deposited from the vapor phase onto steel, iron, copper, nickel, molybdenum, tungsten, graphite, and quartz, is one of the most important uses of Nb and Ta. Thermal dissociation of NbCl₅, NbBr₅, NbI₅, TaCl₅, TaBr₅, and TaI₅ yields metals of highest purity. The reduction of niobium and tantalum pentachlorides by hydrogen is at present the most economical manufacturing technique. Reduction of niobium and tantalum halides, combined with those of alloying admixtures, may open the way to creation of Nb- and Ta based Ti, Zr, Al, W, Mo, and Sn alloys. Thermal curves for the deposition of Nb and Ta-pentahalides obtained by Rolsten (Trans.

Card 1/2

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64
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ACCESSION NR: AP4017567

Metallurgical Soc, AIME, 215, No. 3, 472, 1952 and J. Electrochem Sc-y, 106, No. 11, 975, 1959) and the work of Yemel'yanov, Yevstyukhin, and Leont'yev (Sb. Metallurgiya i metallovedeniye chisty*kh metallov, no. 2, 27, 1960 and no. 3, 127, 1961) on the kinetics of niobium iodide refining are discussed. The latter identify 2 types of temperature dependence for Nb-deposition — one monotonous at < 620 K and one with a maximum at > 620 K, which is believed to result from the existence of different Nb-iodides at 500-550 K (NbI₃) and 650 K (NbI₅). A maximum Nb-deposition rate of 30 g/hr was reached at 650 K in the reactor and 1135 K on the 1500 mm long thread. Orig. art. has: 5 graphs.

ASSOCIATION: Kafedra fiziko-khimicheskikh issledovaniy proizvodstva poluprovodnikov*kh materialov i chisty*kh metallov, Moskovskiy institut stali i splavov (Department of Physicochemical Studies on the Production of Semiconductors and Pure Metals, Moscow Institute for Steel and Alloys)

SUBMITTED: 20May63

DATE ACQ: 23Mar64

ENCL: 00

SUB CODE: ML

NO REF SOV: 011

OTHER: 021

2/2

Card

POLYAKOV, Ye.A.

Algebras of recursive functions. Alg. i log. 3 no. 1241-56 164
(MIRA 18:1)

POLYAKOV, Ye.A.

Some properties of algebras of recursive functions. Alg. i log.
3 no.3:39-57 '64 (MIRA 18:1)

STAKHANOV, A.I., inzh.; POLYAKOV, Ye.M., inzh.

New means for dust control in coal mines. Bezop.truda v
prom. 4 no.8:23-25 Ag '60. (MIRA 13:8)

1. Upravleniye Luganskogo okruga Gosgortekhnadzora USSR.
(Voroshilovgrad Province--Mine dusts--Safety measures)

KONYUSHENKO, A.T.; GOLOVKIN, R.V.; KONSTANTINOV, V.I.; POLYAKOV,
Ya.M.

Manufacture of tantalum tubes. TSvet.met. 33 no.1:60-67
Ja '60. (MIRA 13:5)

1. Moskovskiy trubnyy zavod (for Konyushenko, Golovkin).
2. Moskovskiy elektrolampovyy zavod (for Konstantinov, Polyakov).
(Tantalum)

68591

S/136/60/000/01/012/021
E091/E255

175100

AUTHORS: Konyushenko, A. T., Golovkin, R. V., Konstantinov, V. I.,
and Polyakov, Ya. M.

TITLE: Manufacture of Tantalum Tubes

PERIODICAL: Tsvetnyye metally, 1960, Nr 1, pp 60-67 (USSR)

ABSTRACT: The authors have developed a new and efficient technique for fabricating metal tubes, among them tantalum tubes. The process consists in butt-welding strip and forming it into tubes; these are welded by argon arc in an existing reconstructed automatic electric welding tube mill and subsequently passed through rolling mills (Fig 1). The dimensions of the original strip are determined by the size of the tube required and the possibility of its manufacture in a given plant. The application of clamps and directing instruments in rolling prevents scrap due to strip coming out in a crescent-shaped form. Cutting of the strip edges is carried out with disc shears. Pieces of strip were butt-welded by argon arc welding in the modernized automatic machine "ADS-1000-2" by constant direct current (experiments on the welding of tantalum strip with alternating current have not given

Card 1/3

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S/136/60/000/01/012/021
E091/E255

Manufacture of Tantalum Tubes

satisfactory results). Tungsten rods (VT-15) containing 1.5% thorium oxide were used as electrodes. Saturation of tantalum with nitrogen and oxygen increases the hardness and brittleness of the metal. To prevent this effect the welding zone (the pool of molten metal and the joint both sides of the strip along a length of 50 to 70 mm) was protected by inert gas (argon containing 0.23% nitrogen and 0.05% oxygen) (see Table 1). The strip can be annealed either before butt-welding or after welding and cleaning of the joint. Annealing was carried out by soaking for 1.1/2 hours in an electric vacuum furnace of the TsEP-273 type, at a temperature of 1200°C with a residual pressure of 10^{-4} mm Hg. The weight of the charge was 30 to 40 kg. Prior to being charged into the furnace the strip was thoroughly washed with acetone. The annealed strip had a UTS (σ_b) of 51 kg/mm², a percentage elongation (δ) of 24.8% and a Rockwell hardness (HRB) of 75; the above mechanical properties show that although not fully annealed, the strip was annealed sufficiently to be formed into tube billets (Table 2). In the continuous forming of the tantalum strip the shaping

Card 2/3

68591

S/136/60/000/01/012/021
EO91/E255

Manufacture of Tantalum Tubes

rolls used were graduated and had groove profiles as shown in Fig 2. Argon was applied to the internal surface of the joint through the end of a hollow rod which was fixed between the fifth and sixth shaping stands. Argon was also applied to the external surface of the joint, by a supplementary nozzle (Fig 3). The best results in the welding of tantalum tubes were obtained when the welding procedures indicated in Table 3 were applied. Table 4 shows the test results on welded tube specimens at various annealing temperatures. In Table 5 the best rolling method for tantalum tubes is given. Tubes of niobium, tantalum, cobalt and their alloys have been fabricated by the new technique. There are 3 figures, 5 tables and 3 Soviet references.

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Card 3/3

13(5)

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Argon Shielded Arc Welding of Tantalum

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ABSTRACT:

The acceleration in the development in the chemical industry, which was urged by the plenary session of the Central Committee of the Communist Party of the Soviet Union in May 1958, depends to a considerable degree on the use of new, highly effective alloys and metals. Especially important in this connection is tantalum, which is very refractory and extremely resistant to corrosion, mainly in regard to acids. In the following part of the article the main physical and mechanical qualities of tantalum are compared with those of titanium, aluminum, and iron (Tables 1 and 2). In spite of its relatively low strength tantalum is used in a number of industrial branches.

Card 1/5

Argon Shielded Arc Welding of Tantalum

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Especially in the chemical industry it is used because of its high resistance to corrosion. In the following part the authors speak about the use of tantalum in the USA and about the different ways the metal is used. The wide application of tantalum made it necessary to work out methods for welding this metal. The foreign literature discusses some aspects of arc welding of tantalum. There are, however, no data given about the technology employed in producing the welds, and the welding equipment is not described. In Soviet literature, there are no publications about argon-shielded arc-welding of tantalum. Therefore, the authors give some data for the welding of Soviet tantalum. Tantalum plates (lamellas) of 75x150 mm with a thickness of 1.0, 1.5, 2.0 and 2.5 mm were used for the experiments. Before the welding the plates were ungreased. Argon was used to shield the arc and the welding. The electrodes were made of wolfram. In setting up the working data for the welding, the directions given in the literature and the experiences acquired in welding titanium, which is similar to tan-

Card 2/5