SHERSTYUK, Anatoliy Fedorovich; VERBITSKIY, G., red.; DANILINA, A., tekhn.red.

[People's Bulgaria is blooming] Rastsvetaet narodnaia Bolgariia. Moskva, Gos.izd-vo polit.lit-ry, 1959. 110 p. (MIRA 12:9)
(Bulgaria--Politics and government)
(Bulgaria--Economic conditions)

15-57-4-4631

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 4, pp 92-93 (USSR)

AUTHOR: Sherstyuk, A. I.

TITLE: Fluorite and Stilbite From the Rezh Region (Flyuorit i desmin iz Rezhevskogo rayona)

PERIODICAL: Tr. Sverdl. gorn. in-ta, 1956, Nr 26, pp 104-107.

APSTRACT: In the Rezh region fluorite-bearing quartz-muscovite and plagioclase veins with epidote-phlogopite and fluorite-muscovite pyritized borders occur near granites, in gabbro-amphibolites, amphibolites, and amphibolite schists. The fluorite forms thin veinlets of lilac color in micaceous borders and also formless accumulations of deep violet and rose colors. Bands of deep-violet fluorite occur immediately next to the muscovite borders. Toward the center of the vein they give way to light-violet, rose, colorless, and milky-white bands. Along the eastern contact of the granites in the Rezh region pegmatite veins are found that

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Fluorite and Stilbite From the Rezh Region (Cont.)

contain quartz, feldspar, stilbite, fluorite, and muscovite. Sheaf-like aggregates of white stilbite tinged with yellow occur in a massive granular aggregate of albitized feldspar, and form from 20 to 30 percent of the total quantity of the feldspar mass. The stilbite aggregates reach 3 cm in length. The mineral has a glassy luster, a hardness of 3 to 4, and a negative elongation. Ng = 1.501, Nm = 1.498, Np = 1.494; Ng - Np = 0.007. The mineral is optically negative and has a 2V of 33°. It decomposes in HCl with separation of powdery silica. In the granular aggregate of feldspar, a very few small grains and crystals of fluorite are found with the stilbite. These are predominantly octahedral in outline and light-green in color. The border parts of the crystals have a lighter color than the central parts. Occasionally small cubic crystals of fluorite are encountered. Small grains and crystals of fluorite locally grow on granular aggregates of quartz. The fluorite crystals are younger than the tectonic movements and formed from hydrothermal solutions, which also produced albitization and zeolitization of the potassium feldspars.

Card 2/2

G. A. G.

SHERSTYUK, A.I.

Effect of isomorphous admixtures in beryl on its refractive index. Nauch.dokl.vys.shkoly; geol.-geog.nauki no.2:51-56 '58. (MIRA 12:2)

1. Sverdlovskiy gornyy institut, kafedra mineralogii.
(Beryl) (Mineralogy, Determinative) (Refractive index)

SHERSTYUK, A.I.

Metasomatic changes in basic and ultrabasic rocks near the high-temperature pneumatolith-hydrothermal veins. Izv.vys. ucheb.zav;geol. i razv. 4 no.8:43-51 Ag '61. (MIRA 14:9)

1. Sverdlovskiy gornyy institut imeni V.V. Vakhrusheva.
(Ural Mountain region--Metasomatism)

SHERSTYUK, A.I.

Amazonite and fluorite from the Murzinskiy granite massif.
Trudy Gor.-geol.inst. UFAN SSSR no.56:81-83 '61. (MIRA 15:7)
(Rezh District—Amazonstone)
(Rezh District—Fluorite)

ACCESSION NR: AT4019300 S/0000/63/003/001/0119/0122

AUTHOR: Tudorovskaya, N. A. ; Sherstyuk, A. I.

TITLE: Study of the process of catalyzed crystallization by the method of differential thermal analysis

SOURCE: Simpozium po stekloobraznomu sostoyaniyu. Leningrad, 1962. Stekloobraznoye sostoyaniye, vy*p. 1: Katalizirovannaya kristallizatsiya stekla (Vitreous state, no. 1: Catalyzing crystallization of glass). Trudy* simpoziuma, v. 3, no. 1. Moscow, Izd-vo AN SSSR, 1963, 119-122

TOPIC TAGS: thermal analysis, glass, glass crystallization, petalite, spodumene, catalyzed crystallization, titanium dioxide, alumina silicate

ABSTRACT: The thermal effect of crystallization was investigated in glasses of the system Li_2O-Al_2O_3-SiO_2 having the composition of petalite or spodumene with admixtures of TiO_2 and other oxides in amounts less than 10% by weight. X-ray and mineralogical analysis showed that in glass having a composition close to spodumene, the first thermal effect is produced by the crystallization of the high-temperature spodumene. The presence of the second high-temperature effect shows that a second, more refractory

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ACCESSION NR: AT4019300

phase is also crystallized in these glasses. For the two glasses investigated (glass 13 with 5% TiO_2 and spodumene glass), thermograms were obtained at a hearing rate of 2-29 degrees/minute. The time during which the thermal effect disappears completely at a given temperature of exposure determine the rate of crystallization of the glass at this temperature. For glass 13, the effect of TiO_2 (1-11% by weight) on the thermal effect was also investigated, thermograms being plotted at a heating rate of 7 degrees/min. On the basis of the amount and character of the exothermal effects on the thermogram, the amount of each crystallized phase could be determined. Surface crystallization and overall crystallization could also be distinguished on the thermograms. The relative amount of crystallized phase was calculated from the thermograms by the method fo A. G. Vlasov and A. I. Sherstyuk. Orig. art. has: 2 figures and 2 tables.

ASSOCIATION: None

SUBMITTED: 17May63 DATE ACQ: 21Nov63 ENCL: 00

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

Card 2/2

ACCESSION NR: AT4019299 S/0000/63/003/001/0116/0119

AUTHOR: Vlasov, A.G.; Sherstyuk, A. L.

TITLE: Theoretical investigation of the possible use of the method of differential thermal analysis for the quantitative study of the crystallization process

SOURCE: Simpozium po stekloobraznomu sostoyaniyu. Leningrad, 1962. Stekloobraznoye sostoyaniye, vy*p. 1: Katalizirovannaya kristallizatsiya stekla (Vitreous state, no. 1: Catalyzing crystallization of glass). Trudy* simpoziuma, v. 3, no. 1. Moscow, Izd-yo AN SSSR, 1963, 116-119

TOPIC TAGS: crystallization, thermal analysis, thermogram, glass

ABSTRACT: The method of differential thermal analysis used hitherto is unsuitable for the accurate determination of the amount of crystallized phase, which is absolutely essential for the study of the nature and dynamics of crystallization. For this purpose, new experimental methods are suggested and formulas are derived. The logarithm of the temperature difference θ is plotted against time in typical curves obtained from the thermograms. The study of these diagrams showing the relationship between θ and t makes it possible to determine all the thermal characteristics of the test sample. Another very important value

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ACCESSION NR: AT4019299

is δ, the specific thermal effect of the reaction, which is proportional to the amount of noncrystalline phase. By comparing the δ values obtained for different substances, the degree of crystallization of the material in relation to its preliminary treatment can be established. By increasing the rate of heating, t_{max} becomes less dependent on α (reaction rate), thus decreasing the accuracy of the estimation of α by the time of maximum deviation. In practice, the accuracy of the values α and δ is $\pm$ 10%. The accuracy of the calculation can be improved considerably by a more accurate solution of the thermal conductivity equation with the given limiting conditions and nonstationary heat sources uniformly distributed inside the sample. The function of the heat sources F (t, T) will also have some independent parameters, which must be determined experimentally. Orig. art. has: 1 figure and 14 formulas.

ASSOCIATION: none

SUBMITTED: 17May63	DATE ACQ: 21Nov63	ENCL: 00
SUB CODE: MT, GC	NO REF SOV: 000	OTHER: 000

Card 2/2

TUDOROVSKAYA, N.A.; SHERSTYUK, A.I.

Studying the process of catalyzed crystallization by the method of differential thermal analysis. Stekloobr. sost. no.1:119-122 '63. (MIRA 17:10)

CHERKASOV, S.I.

Mica complexes and their classification. Zap. Vses. min. ob-va 94 no.1:62-70 '65. (MIRA 18:3)

1. Sverdlovskiy gornyy institut, kafedra petrografii.

SHERSTYUK, A. N.

"Construction of the Characteristics of Multistage Axial and Centrifugal Compressors According to the Stage Characteristics".
Kotloturbostroyeniye, No. 1, ppll-16, 1953

The method suggested by the suthor is based on the following two assumptions: 1. The abstract characteristics -- dependence of the coefficients of stress and efficiency upon the consumption coefficient -- are indentival for all stages. 2. The relative temperature change before any stage ab all points of the characteristic is less than 0.15. In accordance with the given abstract characteristics of a stage, an auxiliary conditional characteristic is constructed in logarithmic coordinates. This makes it possible to determine the efficiency coeffiency coefficient for various peripheral velocitied of the rotor. (RZhMekh, No 8, 1955)

SO: Sum No 812, 6 Feb 1956

SMIRNOV, A. M.

The determination of the resistancy limit in the operation of vents, pumps and compressors. "Inzhinernyy Sbornik" by Academy of Sciences of the USSR, Department of Technical Sciences, Institute of Mechanics. 1955.

SHERSTYUK, Aleksandr Nikolayevich; SAMOYLOVICH, G.S., redaktor; VORONIN, K.P., tekhnicheskiy redaktor.

[Axial flow compressors; aerodynamic calculations] Osevye kompressory; aerodinamicheskiy raschet. Moskva, Gos.izd-vo, 1955. 247 p. (MIRA 8:4)
(Air compressors)

SHERSTYUK, A.N.

AID P - 2566

Subject : USSR/Engineering

Card 1/1 Pub. 110-a - 5/16

Author : Sherstyuk, A. N., Kand. Tech. Sci.

Title : Method of approximate calculation of curvilinear canals

Periodical : Teploenergetika, 8, 26-29, Ag 1955

Abstracts : A method for estimating potential compressible and incompressible flow in curvilinear canals is presented on the basis of mathematical analysis. It is mentioned that this method was devised by G. Flyugel and later developed by G. Yu. Stepanov. Seven diagrams. Two Russian references, 1953, 1954.

Institution : Moscow Power Engineering Institute

Submitted : No date

SHERSTYUK, A.N.

of flow in the system for steady operation. Its magnitude is indicated by treating a particular example.

J. R. Weske, USA

KIRSANOV, Igor' Nikolayevich; SHERSTYUK, A.N., redaktor; VORONIN, K.P., tekhnicheskiy redaktor

[Stationary steam turbines] Statsionarnye parovye turbiny. Moskva, Gos.energ. izd-vo, 1956. 199 p. (MLRA 9:11)
(Steam turbines)

Sherstyuk, A. N.

AID P - 4384

Subject : USSR/Power Engineering

Card 1/1 Pub. 110 a - 10/17

Author : Sherstyuk, A. N., Kand. Tech. Sci. Moscow Power Institute

Title : On calculating centrifugal blowers and pumps

Periodical : Teploenergetika, 5, 47-51, My 1956

Abstract : A mathematical analysis to facilitate the choice of dimensions and revolutions of fans and pumps is presented. Two diagrams. Four Russian references, 1950-1954.

Institution : None

Submitted : No date

AERODYNAMICS

68/12/12 533.691.13

Calculation of Aerofoil Profiles at High Subsonic Speed

Izv. Akad. Nauk, Otd. tekh. Nauk, (8), 125-127, 1956

A. N. Sherstyuk U. S. S. R.

The basic idea of the method of small disturbances is used to calculate the distribution of velocity and speed on the profile in compressible fluid using the known distribution of velocity and pressure on the profile in incompressible fluid. The deformation of the profile is assumed negligible. By transforming the equations the precision of the method has been improved. The method is also applicable to the calculation of a lattice of slightly cambered profiles. Bibl. 4.

Sherstyuk, Aleksandr Nikolayevich

PHASE I BOOK EXPLOITATION 446

Sherstyuk, Aleksandr Nikolayevich

Ventilyatory i dymososy (Ventilators and Exhaust Fans) Moscow, Gosenergoizdat, 1957. 183 p. 7,000 copies printed.

Ed.: Nevel'son, M.I.; Tech. Ed.: Medvedev, L.Ya.

PURPOSE: This is a textbook on blowing engines for students of power engineering institutes and it may also be useful to engineers engaged in designing and operating such equipment.

COVERAGE: This book deals with design and operation of exhausters and fans. Special emphasis is placed on forced draft fans used in heat power plants. The book contains contributions of the Heat Engineering Department of the Moscow Power Engineering Institute. The author begins with the basic concepts of hydraulics and proceeds to the use of models for fan design and selection. Operation and testing of fans are also discussed. One chapter is devoted to modern types of fans and exhausters manufactured in

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Card 7/8

SHERSTYUK, A. N.

KORNEYCHUK, Nikolay Karpovich; CHERNOV, Aleksandr Vasil'yevich; SHERSTYUK, A.N., nauchnyy redaktor; ROGACHEV, F.V., redkaktor; RAKOV, S.I., tekhnicheskiy redaktor

[Machinery] Mashinovedenie. Moskva, Vses.uchebno-pedagog. izd-vo Trudrezervizdat, 1957. 439 p. (MLRA 10:8)
(Engines)

NEVEL'SON, M.I., kand. tekhn. nauk; SHERSTYUK, A.N., kand. tekhn. nauk.

Modeling centrifugal fans. Energomashinostroenie 3 no.10:18-19 O '57.
(Fans, Mechanical--Models) (MIRA 10:12)

AUTHOR: Sherstyuk, A. N. (Moscow). 24-4-18/34

TITLE: Potential flows past profiles of confusor and diffusor cascades at sub-sonic speeds. (Potentsial'noye obtekaniye profiley konfuzornykh i diffuzornykh reshetok pri dozvukovykh skorostyakh).

PERIODICAL: "Izv. Ak. Nauk, Otd. Tekh. Nauk" (Bulletin of the Ac. Sc., Technical Sciences Section), 1957, No.4, pp.123-126 (USSR).

ABSTRACT: A variant of the method of Khristianovich (1) is given which permits increasing the accuracy of calculation of cascades at high sub-sonic speeds. If the parameters of the flow of the incompressible liquid are known, it is easy to determine according to Fig.2 the speed of the gas λ and then, by means of eq.(3.2), p.125, to determine the lines of the flow and the equipotential lines of the gas flow. Changes in the cascade pitch and in the profile setting angle can be determined accurately, irrespective of the shape of the profile; the pitch of the profile, t, can also be easily determined. There are 2 figures and 2 Russian references.

SUBMITTED: August 29, 1956.

AVAILABLE:

Card 1/1

LUKNITSKIY, V.V. [deceased], doktor tekhn. nauk, prepodavatel'; SOKOLOV, Ye.Ya., doktor tekhn. nauk, prepodavatel'; LEBEDEV, P.D., doktor tekhn. nauk, prepodavatel'; GIMMEL'FARB, M.L., kand. tekhn. nauk, prepodavatel'; LAVROV, N.V., doktor tekhn. nauk, prepodavatel'; IVANTSOV, G.P., kand. tekhn. nauk, prepodavatel'; GOLUBKOV, B.N., kand. tekhn. nauk, prepodavatel'; SHERSTYUK, A.N., kand. tekhn. nauk, prepodavatel'; NIKITIN, S.P., kand. tekhn. nauk, prepodavatel'; CHISTYAKOV, S.F., kand. tekhn. nauk., prepodavatel'; DUDNIKOV, Ye.G., doktor tekhn. nauk, prepodavatel'; BAKLASTOV, A.M., kand. tekhn. nauk, prepodavatel'; VEKHA, M.I., kand. tekhn. nauk, prepodavatel'; GERASIMOV, S.G., prof., red.; KAGAN, Ya.A., dots., red.; AYZENSHTAT, I.I., red.; VORONIN, K.P., tekhn. red.; LARIONOV, G.Ye., tekhn. red.

[Heat engineering handbook] Teplotekhnicheskii spravochnik. Moskva, Gos. energ. izd-vo. Vol.2. 1958. 672 p. (MIRA 11:10)
(Heat engineering)

SOV/24-58-4-11/39

AUTHORS: Samoylovich, G.S. and Sherstyuk, A.N. (Moscow)

TITLE: The Calculation of Curvilinear Axisymmetric Channels (Raschet krivolineynykh osesimmetrichnykh kanalov)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 4, pp 78 - 81 (USSR)

ABSTRACT: A method is described for the approximate calculation of the potential flow of an incompressible fluid in axisymmetric curvilinear channels (the intakes of centrifugal and axial compressors, diffusers at the exhausts of axial compressors, etc.). The calculation is based on a generalisation of the method of calculating plane curvilinear channels (Ref 1). There is a comparison between the calculated results and exact solutions. Good agreement is obtained. There are 5 figures and 1 Soviet reference.

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow Power Institute)

SUBMITTED: October 24, 1957

Card 1/1

DEYCH, M.Ye.; ZAKYANKIN, A.Ye.; SHERSTYUK, A.N.; DINEYEV, Yu.N.

Investigation of gate mechanisms of radial-flow turbines.
Nauch.dokl.vys.shkoly; energ. no.4:195-206 '58.
(MIRA 12:5)

1. Rekomendovana kafedroy parovykh i gazovykh turbin Moskovskogo energeticheskogo instituta.
(Gas turbines)

SHERSTYUK A. N.

AUTHOR: Sherstyuk, A.N. (Cand.Tech.Sci.) 96-3-1/26

TITLE: The design of aerodynamic gratings at high subsonic speeds. (Raschet aerodinamicheskikh reshetok pri bol'shikh dozvukovykh skorostyakh.)

PERIODICAL: Teploenergetika, 1958, 5, No.3. pp.14-16 (USSR)

ABSTRACT: Available methods of designing aerodynamic gratings at high subsonic speeds are laborious and rather inaccurate. Simpler available methods are not accurate enough close to the inlet and outlet edges of the blade. This short article describes a simple approximate method applicable to the design of gratings with small relative blade pitch. The design procedure is as follows: the velocity distribution over the profile is given for an incompressible liquid and the corresponding velocity distribution with a gas is found. Calculation of the potential flow of an incompressible liquid may be made by existing analytical procedures or by an analogue method. The potential flow of gas at high subsonic speeds is considered (See Fig.1.) The equation of motion of the gas is given in a previously published form. Simplifying assumptions are stated and a graph that may be used to simplify the calculation is given in Fig.2. The length of the equipotential line on the blade is determined graphically as shown in Fig.3. Satisfactory agreement is claimed between calculated and test data. By way of example Fig.4.

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The design of aerodynamic gratings at high subsonic speeds. 96-3-4/26

shows experimental and calculated data for the velocity distribution on grids of turbine blading. There are 4 figures, 3 literature references (Russian).

ASSOCIATION: Moscow Power Institute (Moskovskiy Energeticheskiy Institut).

AVAILABLE: Library of Congress.

Card 2/2

SHERSTYUK, A.N., kand.tekhn.nauk

Selecting the size of air drums for piston compressors. Vest. mash. 38 no.9:18-19 S '58. (MIRA 11:10)
(Air compressors)

25(2) PHASE I BOOK EXPLOITATION SOV/3027

Sherstyuk, Aleksandr Nikolayevich

Kompressory (Compressors) Moscow, Gosenergoizdat, 1959. 190 p. Errata slip inserted. 17,000 copies printed.

Ed.: D.S. Rasskazov; Tech. Ed.: N.I. Borunov.

PURPOSE: This textbook is to be used for the general course, Air-blowing Machinery. It may also be used by designers and engineers.

COVERAGE: The fundamentals, theory, design, and operation of centrifugal, axial, and piston compressors are discussed. Information on rotary compressors and the mounting and installing of piston compressors is presented. No personalities are mentioned. There are 64 references: 52 Soviet, 10 English, and 2 German.

TABLE OF CONTENTS:

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AVAILABLE: Library of Congress

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2-24-60

Card 5/5

SHERSTYUK, A.N.

Design of main gas pipelines. Nauch.dokl.vys.shkoly; energ. no.1:181-187 '59. (MIRA 12:5)

1. Rekomendovana kafedroy ekonomiki promyshlennosti i organizatsii predpriyatiya Moskovskogo energeticheskogo instituta.
(Gas--Pipelines)

SOV/96-59-6-5/22

AUTHOR: Sherstyuk, A.N. (Candidate of Technical Sciences)

TITLE: Loss Determination in Turbine Blades with Thick Outlet Edges (K opredeleniyu poter' v turbinnykh reshetkakh s utolshchennymi vykhodnymi kromkami)

PERIODICAL: Teploenergetika, 1959, Nr 6, pp 26-28 (USSR)

ABSTRACT: In gas turbines, when the inlet gas temperature exceeds 700 to 750 °C it is necessary to cool the stator and rotor bladings. Several effective methods of blade cooling necessitate the use of thickened profiles, particularly at the outlet edges. This thickening of the outlet edges may cause appreciable losses which it is necessary to evaluate. Little work has been published on this subject, though Flyugel' in his book on Steam Turbines published in 1939 gave expression (1) which is an empirical formula for the loss due to thickening of the blade edges. A theoretical formula for the edge losses in straight-edged blading was given by G.Yu. Stepanov. It is in good agreement with experimental data but is very difficult to use because it requires experimental determination of the pressure at the blade edge. A new theoretical solution of this problem is then given, with reference to the blading diagram of Fig 1.

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Loss Determination in Turbine Blades with Thick Outlet Edges

The outlet angle of the flow is given by the approximate empirical formula (2). Expression (3) is given for the effective width of the throat between the blades. An expression is then derived, ignoring compressibility, for the total energy losses on going from section 1-1 to 2-2 (see Fig 1). Expression (5) is then easily derived for the value of the edge loss. Graphs of the edge loss as a function of the outlet-edge thickness and inter-blade channel geometry are given in Fig 2; each curve corresponds to a particular value of the ratio of effective to theoretical throat width. The dotted graph on Fig 2 corresponds to formula (1). In order to check the accuracy of formula (5) a comparison was made between experimental and calculated data for a number of blade profiles. The results of the calculations are given in Figs 4 and 5, and are briefly discussed. It is considered that in all cases the agreement between test and calculated data is satisfactory. Moreover,

Loss Determination in Turbine Blades with Thick Outlet Edges

formula (5) explains the observed dependence of the edge loss on the relative pitch of the blading.
There are 5 figures and 2 Soviet references.

ASSOCIATION: Moskovskiy energeticheskiy institut
(Moscow Power Institute)

10.2000, 10.3000

SOV/96-59-11-14/22

AUTHORS: Deych, M. Ye., Doctor of Technical Sciences, Zaryankin, A. Ye., and Sherstyuk, A. N., Candidates of Technical Sciences

TITLE: New Designs of Nozzle Blading for Supersonic Speeds

PERIODICAL: Teploenergetika, 1959, Nr 11, pp 65-68 (USSR)

ABSTRACT: There is a need for high-efficiency nozzle blading for supersonic speeds. Expanding nozzle blade profiles developed in recent years are of high efficiency under designed operating conditions, but the efficiency falls off rapidly when the conditions are changed. This will be seen from curve 1 of Fig 1 which gives profile losses as function of Mach number for expanding nozzles type TS-2V. At the design condition of Mach 1.6 the losses are only 10%, but at Mach 1 they become 31%. Normal nozzles with contracting channels work well only at moderate supersonic speeds; see, for example, curve 4 in Fig 1. Methods of reducing the losses at supersonic pressure-drops may be evolved from the formulae for the change of direction of flow in the skew section of the nozzles. To this end sections before and after the nozzle are considered, as shown in Fig 2.

Card 1/4 The equations of continuity, conservation of energy and

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New Designs of Nozzle Blading for Supersonic Speeds

condition are applied to these two sections and formula (1) is derived for the relationship between the flow conditions before and after the blading. From this formula it is easy to determine the change of direction of flow in the skew section of the nozzle at supersonic pressure drops, and formula (2) accordingly is derived. If an experimental relationship between the velocity ratio and pressure ratio is used, formula (2) is very accurate. The accuracy is evident from Fig 3, where experimental values are compared with values calculated by formula (2). It has been shown that in nozzles with expanding channels, for example those of the Moscow Power Institute, the mean angle of discharge does not depend much on the operating conditions. For this case formula (2) may be used to determine the relationship between the velocity coefficient and the pressure ratio, as seen in Eq (3). The comparison of theoretical and experimental results given in Fig 4 confirms the good agreement. This agreement was obtained without detailed analysis of the nature of flow in the blading. Hence,

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New Designs of Nozzle Blading for Supersonic Speeds

if the blading is made in such a way that the discharge angle does not depend on the operating conditions, then the losses must inevitably rise when the Mach number is decreased. In this case the losses depend only on the loss under design conditions of operation and on the pressure ratio. This conclusion served as a criterion of blade shape for supersonic pressure-drops. The blade shapes should ensure variable discharge angle on change of pressure-ratio and, therefore, the discharge portion of the rear of the blade should be slightly bent so as to increase the discharge area. Such blade profiles differ from ordinary nozzle blades with contracting channels only in the shape of the back face of the blades. A group of new blade profiles that meet this requirement are shown in Figs 5 and 6. Loss as a function of Mach number for the new profile TS-2RV is plotted in curves 2 and 3 in Fig 1. It will be seen that for blading of similar efficiency at 1.5 the new blading has much lower losses at lower Mach numbers. Blade shape TS-1RV is recommended for nozzles where the Mach number is 1.3 and blade shape TS-2RV when the Mach number is 1.5. Blades with backs of the new shape should

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New Designs of Nozzle Blading for Supersonic Speeds

be used for guide vanes and working blading in stages with long blades, and in particular for the last stages of condensing turbines which operate at high supercritical heat-drops. In the root section of such stages, the velocity at the outlet from the guide vanes is, as a rule, appreciably higher than the speed of sound. The discharge angle from runner blades is also supersonic near the periphery. As the last stages may operate under very variable conditions, both guide vanes and runner blades should have a curved back in the skew section. There are 6 figures, 2 tables, and 2 Soviet references.

ASSOCIATION: Moskovskiy energeticheskiy institut (The Moscow Power Institute)

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D221/D302

26.2120

AUTHOR: Sherstyuk, A.N., Candidate of Technical Sciences

TITLE: Calculating speeds in rotors of radial turbines

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Mashinostroyeniye, no. 2, 1960, 124 - 133

TEXT: The author proposes a simplified method of calculating the speed of flow by reducing the three-dimensional problem to two dimensions. Three problems of practical interest are quoted. The first concerns a rotor with straight blades (Fig. 1). Dotted lines represent the curvilinear part of the blades calculated by usual methods when Coriolis forces are insignificant. The flow in the main part of the channel can be considered as taking place in meridional sections. An elementary volume dv is considered, on which the following forces are acting: Centrifugal in the relative motion; centrifugal in the transfer motion and force that is produced by the difference of pressures. The publication mentioned provides the approximate solution of speed distribution as per

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$$w = \frac{w_a}{1 + \bar{h} - k_1 \bar{h}^2} ; \qquad (2)$$

where w_a is the speed at point A, other members being ratios of size parameters of the element. The author cites the graph of speed ratio. It should be remembered that speeds at different meridional sections differ from each other due to various speeds w_a. Mathematical analysis is included to support this view. The expressions are valid for the flow of compressible non-viscous fluid. Analytical equations are given for a non-compressible fluid. They allow, together with the above mentioned expressions determination of speeds in all sections, except the small sections of inlets and outlets of the channels. The same method can be applied for calculating rotors with any shape of blades; the equations, however, are too complicated. In the general case, it is expedient to limit this by determining the averaged speeds in the peripheral direction. A differential equation which determines the absence of motions along the orthogonals h (Fig. 1a), is worked out in a simi-

lar manner to the previous case. Check computations of single stage radial turbines and compressors demonstrate that the field of meridional projections of speeds is irregular. When the disc and ring are flat then the flow in the rotor can be considered as plane parallel, thus reducing the problem to two dimensions. Mathematical equations are quoted for the above. In order to assess speeds near the inlet and outlet edges, it is necessary to elongate the boundary lines of the stream inside the flow. Using equations obtained to investigate the flow in channels between blades, important deductions can be made. In particular, it must be noted that the effect of Coriolis forces has a different effect on flows in radial turbines (centripetal and centrifugal). The irregularity is increased in the first instance, but improved in the case of centrifugal motions. This should be taken into consideration when profiling rotor blades. There are 5 figures and 4 Soviet-bloc references.

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow Power Institute)

SUBMITTED: December 15, 1959

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S/024/60/000/02/022/031
E194/E155

AUTHOR: Sherstyuk, A.N. (Moscow)

TITLE: On the Determination of Losses in Turbine Blading when the Angle of Attack is Incorrect

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1960,Nr 2,pp 177-180 (USSR)

ABSTRACT: Existing methods of assessing the losses that occur when the angle of attack is not as designed are seldom accurate for all types of blading. This brief article is concerned with deriving improved formulae. The simple case of thin straight flat blading is first considered, neglecting compressibility and friction losses. The diagram of Fig 3 is used in deriving the loss formula when the angle of attack is not the same as the angle of installation of the flat blading. The effect of the discrepancy corresponds to a pressure drop, which may be calculated by expression (2.1) and expression (2.2). The latter coincides with Carnot's formula for the loss of pressure when the section of a flow is suddenly increased. The parameters of flow beyond the blading may be calculated with allowance for compressibility, and

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On the Determination of Losses in Turbine Blading when the Angle of Attack is Incorrect

Eq (3.1) is derived. Similar methods may be used to derive a formula for determining the losses in radial blading with thin straight blades, giving expression (4.1) for an incompressible fluid. Real turbine blades are then considered; since the inlet edge is rounded, the pressure loss is less than that given by Eq (2.2). A correction factor is then introduced, as in expression (5.1), and an appropriate value of this factor is recommended for modern blade profiles. Expression (5.2) is then derived for the relationship between the velocity factor with the designed angle of inlet and with other angles. The practical value of formulae (5.1) and (5.2) depends on the validity of the blading correction factor when the angle of attach and the types of profile are changed. Some idea of the accuracy of formula (5.2), assuming a constant correction factor, may be obtained from Fig 5, which compares experimental and calculated data for three blades, two active and one reactive. The satisfactory agreement between theory and calculations in

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On the Determination of Losses in Turbine Blading when the Angle of Attack is Incorrect

these cases shows that formula (5.2) may be recommended for determination of the velocity factor.
There are 5 figures and 3 Soviet references.

SUBMITTED: November 9, 1959

Card 3/3

69384

S/129/60/000/06/001/022
E073/E535

18.1130

AUTHORS: Silayev, A.F., Fedortsov-Lutikov, G.P. and Sheshenev, M.F. Candidates of Technical Sciences

TITLE: Properties of Castings of the Steel 12Kh11V2NMF-L

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1960, Nr 6, pp 2-7 (USSR)

ABSTRACT: Use of austenitic steels for cast components of turbines and fittings operating at 600 and 610°C is inadvisable due to their high cost, low thermal conductivity and relatively poor technological properties. Therefore, intensive research work is being carried out in various countries to develop for this purpose pearlitic class steels and steels with 11 to 13% chromium. Investigations showed that if properly alloyed, pearlitic steels, and particularly stainless chromium steels of the type 1Kh13, are suitable for operation in this temperature range. The subject of the work described in this paper was to determine the effectiveness of small additions of horophilic elements (barium, calcium, cerium) on the properties of type 12Kh11V2NMF steel. For the purpose

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Properties of Castings of the Steel 12Kh11V2NMF-L

of comparison, one melt (7-104) was produced without any additions. The chemical compositions of the commercial heats used in the experiments are entered in Table 1. Optimum heat treatment for this steel proved to be as follows: homogenization at 1090 ± 10°C; normalization at 1050 ± 10°C; tempering at 700 ± 10°C followed by cooling in the furnace. It was found that in the case of continuous cooling from the range of the austenitic state with speeds below 250°C/hr, there will only be pearlitic transformation, whilst for larger cooling speeds (250 to 3000°C/hr) pearlitic and intermediate transformations take place. The plot, Fig 1, contains data on the mechanical properties of this steel at 20°C for a melt containing Al-Ba-Ce alloying additions. The plot, Fig 2, shows the changes in the impact strength of steel as a function of the test temperature for material containing Al-Ba-Ce additions (curve a), for material without any additions (curve b) and for material with Ca additions (curve B).

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Properties of Castings of the Steel 12Kh11V2NMF-L

The relatively high structural stability of the material is evident from the data on the changes of the chemical composition of the residue produced by electrolytic dissolution of the steel after various ageing regimes, Table 2. Table 3 and Fig 3 show the results of long-run strength tests (up to 2600 hours) in the temperature range 600 to 670°C; the highest values were obtained for material containing small additions of Al-Ba-Ca. Under all test conditions fracture of the specimens occurred along crystallites which were intensively deformed in the neighbourhood of the fracture, as can be seen from the microstructure of a specimen fractured at 610°C after having been stressed for 1011 hours with a stress of 15 kg/mm^2. Fig 5 shows a plot of the creep limit of steel at 610°C for steel containing only Ca additions and for steel containing Al-Ba-Ca additions. The following conclusions are arrived at:

1) Introduction into the steel of a small quantity of a Al-Ba-Ca alloy does not result in any pyro-effect, brings

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Properties of Castings of the Steel 12Kh11V2NMF-L

about a considerable improvement of the technological properties of the tested steel, an increase in the impact strength and ensures a higher degree of hardening in the original state and a less intensive process of softening during operation.

3) Introduction into steel of small quantities of Al-Ba-Ca alloys leads to a reduction of the nonuniformity in the properties along the cross-section and this appears to be due to a greater uniformity of the structure, which leads to a reduction of the size effect.

3) Steel specimens from a 1.3 ton casting, produced with a small addition of Al-Ba-Ca alloying material and subjected to "soft" heat treatment, had the following high temperature properties:

$\sigma^{600°C}_{dr10^5} = 10$ kg/mm^2; $\sigma^{610°C}_{dr10^5} = 9$ kg/mm^2; $\sigma^{610°C}_{n°1\cdot10^{-5}} = 5.8$ kg/mm^2

(dr = do razrusheniya - to failure).

There are 5 figures, 3 tables and 3 Soviet references.

ASSOCIATION: TsNIITMASh

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80408
S/096/60/000/07/012/022
E194/E455

5.1230

AUTHORS: Sherstyuk, A.N., Candidate of Technical Sciences, Zaychenko, Ye.N., Ignat'yevskiy, Ye.A. and Sokolov, A.I., Engineers

TITLE: An Investigation of Inlet Pipe Nozzles for Centrifugal Compressors

PERIODICAL: Teploenergetika, 1960, Nr 7, pp 56-59 (USSR)

ABSTRACT: The design of the inlet pipe influences the efficiency of a compressor in two ways. Firstly, losses in the inlet pipe itself directly reduce the efficiency of the compressor. More important, the shape of the inlet pipe influences the velocity distribution at inlet to the runner. If the distribution becomes unsuitable it can appreciably reduce the efficiency of the runner because the angles of attack at the inlet edge differ from the required values. Despite the practical importance of this question, little experimental work has been done upon it. Accordingly, the present work gives the results of the first stage of an investigation on axially-symmetrical inlet pipes. The tests were made not on a compressor but on a special rig, illustrated in Fig 1,

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3403

S/096/60/000/07/012/022
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An Investigation of Inlet Pipe Nozzles for Centrifugal Compressors

which allows the influence of the runner to be excluded. However, the outline of the duct beyond the inlet pipe is made the same as in a normal runner in order to obtain the required boundary conditions. Tests were taken on 8 types of inlet pipe, 5 being axial and 3 radial. Sketches of the inlet pipes are given in Fig 2. Combined data on the losses are also plotted in the graphs of Fig 2 in each case as functions of Reynolds number. Since Mach numbers were small (less than 0.35), the test results were worked out without allowing for compressibility. All the inlet pipes, except type OR-80-V, have very low loss factors because of the low values of Reynolds number and in all cases there is an appreciable reduction in the losses as the Reynolds number increases. As was to be expected, the axial inlet pipe with the least losses is that in which the ratio of the inlet diameter to the outlet section is greatest. The greatest losses were obtained with the cylindrical inlet pipes. The tests show the advantages of using short cowls over the runner inlet. Data on the velocity distribution in the discharge section of the

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An Investigation of Inlet Pipe Nozzles for Centrifugal Compressors

inlet pipe are also presented in Fig 2. The tests were made for various values of average speed up to 110 metres/sec but because of the very slight influence of the Reynolds number of the velocity distribution Fig 2 gives mean curves. In all cases, except those of the conical and cylindrical inlet tubes, there is marked distortion of the velocity distribution. If the runner were designed without allowing for this distortion, there could be substantial reduction in efficiency. In the axial inlet tubes, the velocity distribution depends on the length of the cowl. It is most uniform with a cowl of medium length and comparatively uniform with a cylindrical inlet tube; but cylindrical tubes are not to be recommended because of their inherently high losses. Conical inlet tubes give a uniform velocity field and have small losses. Thus they are the most suitable of the axial inlet tubes, provided they can be accommodated in the overall dimensions. Their main disadvantage is their great length which can be overcome by making a profile of the kind illustrated in Fig 3. The results

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with the radial and diagonal inlet tubes are of special interest because these types sometimes have to be used and it is obvious that the runner design must make appropriate allowance for changes in the velocity distribution. Moreover, inlet tubes of this kind should not be used at high peripheral speeds because the Mach number at the tips of the discharge edges of the runner blades becomes excessive. One of the tasks of the work was to evaluate the reliability of approximate methods of calculating the velocity in relation to the design of the inlet tubes. The point is that approximate methods of calculating on curved channels are sufficiently accurate only if the boundary of the channel changes curvature smoothly. In the case under consideration, the change in curvature is not smooth: from the experimental results and velocity data given in Fig 4, it is concluded that approximate methods of calculation are not sufficiently accurate. Differences between test and calculated velocities may be 10 to 20% and, therefore, in important cases the velocity should

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S/096/60/000/011/017/018
E073/E135

AUTHORS: Deych, M.Ye., Sherstyuk, A.N., Zaryankin, A.Ye., Zatsepin, M.F., and Frolov, L.B.

TITLE: Investigation of Low Power Radial Turbines

PERIODICAL: Teploenergetika, 1960, No. 11, p 94

TEXT: This is an annotation of a recent research report by MEI. The technique of calculation of radial turbines is considered, giving experimental results on determining the influence of the nozzle system, the outflow angle of the flow α_1 and of the twist of the runner wheel, on the economics of the turbine. An electronic r.p.m. gauge is described. A method is presented of plotting profiles of nozzle systems of radial turbines, their geometrical dimensions and their experimental characteristics, and also data on investigating five runner wheels of various types. A maximum stage efficiency of $\eta_{oi} = 0.32$ was obtained. Theoretical considerations are given on calculating the end losses in nozzle lattices with a flow from the centre and towards the centre, and also certain calculations on determining the optimum chord of turbine profiles calculated for subsonic and supersonic flow speeds. There are no figures, tables or references.

Card 1/1

SHERSTYUK, A.N.

Reply to G.IU. Stepanov's remarks. Izv. AN SSSR. Otd. tekh. nauk. Energ. i avtom. no.4:216 Jl-Ag '61. (MIRA 14:9)
(Turbines)

S/143/61/000/002/003/006
A207/A126

26,2120

AUTHORS: Sherstyuk, A. N., Candidate of Technical Sciences, Sokolov, A. I., Engineer

TITLE: Determination of the efficiency coefficient of the diffusion grids from experimental data

PERIODICAL: Energetika, no. 4, 2, 1961, 93 - 96

TEXT: The authors derive the formulae for determining the efficiency coefficient of a straight or radial diffusion grid from experimental data. Graphs are submitted which simplify the calculations considerably. Experiments were made on straight compressor grids (profile packages) which led to the method of determining the coefficient of losses described in this article. There are 2 figures and 2 Soviet-bloc references.

ASSOCIATION: Moskovskiy ordena Lenina energeticheskiy institut, kafedra parovykh i gazovukh turbin (The Moscow Order of Lenin Power Engineering Institute, Department of Steam and Gas Turbines)

SUBMITTED: February 26, 1960

Card 1/1

TRUSOV, S.M., kand.tekhn.nauk; SHERSTYUK, A.N., kand.tekhn.nauk

Calculation of the field of velocities in a hydraulic torque converter. Izv. vys. ucheb. zav.; energ. 4 no.7:107-114 Jl '61. (MIRA 14:7)

1. TSentral'nyy nauchno-issledovatel'skiy avtomobil'nyy i avtomotornyy institut (for Trusov). 2. Moskovskiy ordena Lenina energeticheskiy institut (for Sherstyuk).
(Hydraulic machinery)

ZARYANKIN, A.Ye., kand.tekhn.nauk; SHERSTYUK, A.N., kand.tekhn.nauk;
ZATSEPIN, M.F., inzh.

Experimental characteristics of Francis-type turbines.
Teploenergetika 8 no.6:37-41 Je '61. (MIRA 14:10)

1. Moskovskiy energeticheskiy institut.
(Turbines--Testing)

3u943
S/143/62/000/005/006/007
D238/D302

26.2120

AUTHOR: Chorstyuk, A. N., Candidate of Technical Sciences, Docent

TITLE: Calculating the stages of radial-flow turbines

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Energetika, no. 5, 1962, 53-59

TEXT: The paper is a continuation of the work published in the previous issue of this periodical, to which reference is made for the notations adopted in the formulae. The blade efficiency is accordingly given as a function of the stage reaction, the parameter x_{ad} and the geometrical characteristics of the stage. The stage efficiency is then deduced, taking account of the mechanical losses in the bearings and the disk losses, yielding

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X

Calculating the stages ...

$$n_{oe} = \frac{102\ AN_e}{GH_o} = \frac{GH_b - 102\ A\Delta N_H}{GH_o} \qquad (2)$$

or

$$n_{oe} = \eta_{ob} - 102\ \frac{A\Delta N_H}{GH_o}$$

where ΔN_H represents the mechanical losses in the bearings and the disk losses. A study of particular cases involving radial axial turbines demonstrates the variation in stage characteristics with varying pressure ratio. Three characteristic cases are studied for examining the deviation in gas consumption from the rated, consider-

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ing an incompressible fluid, a gas at sub-critical velocities, and a gas at supercritical velocities. Calculated and experimental curves demonstrate good agreement on gas consumption data for one stage of a radial-axial turbine. The method yields an approximate determination of the main characteristics of a radial-flow turbine stage, such as reaction, efficiency, gas consumption and useful power. The calculations demonstrate the substantial influence of speed on gas consumption. A figure illustrates the design characteristics of a radial axial turbine in reduced coordinates ($\bar{d}_2 = 0.5$; $d_1 = 16^\circ$; $\beta_2 = 30^\circ$; $\varphi^2 = 0.96$; $\psi_0^2 = 0.9$; $k_i = 1$).

ASSOCIATION: Moskovskiy ordena Lenina enegeticheskiy institut
Moscow Order of Lenin Power Institute)

SUBMITTED: April 7, 1961

X

SHERSTYUK, A.N., kand.tekhn.nauk, dotsent

Calculation of the characteristics of radial turbine stages.
Izv. vys. ucheb. zav.; energ. 5 no.2:59-66 F '62. (MIRA 15:3)

1. Moskovskiy ordena Lenina energeticheskiy institut.
Predstavlena kafedroy parovykh i gazovykh turbin.
(Turbines)

AB 2120

37554
S/096/62/000/005/001/009
E194/E454

AUTHORS: Zaryankin, A.Ye., Candidate of Technical Sciences, Sherstyuk, A.N., Candidate of Technical Sciences, Zaitsepin, M.F., Engineer

TITLE: Some ways of increasing the efficiency of mixed flow turbines

PERIODICAL: Teploenergetika, no. 5, 1962, 32-35

TEXT: At low pressure ratios (1.7 to 1.8) the efficiency of mixed flow turbines is around 80%, which it is important to increase because small gas turbines of this type are widely used. When the ratio of the blade width to diameter is below 0.05 appreciable losses occur at discharge from the nozzles and runner and due to disc friction. Nozzle efficiency can be increased by meridional profiling, that ismachining the blade with a twist in it, which reduces the speed and final pressure drops in the region of maximum curvature of gas flow. However, in some cases meridional profiling, whilst reducing the losses at subsonic speeds may increase them at supersonic speeds and whilst potentially very advantageous, the subject requires much further experimental study.
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Some ways of increasing ...

be converted in the subsequent diffuser section. If the turbine discharges to atmosphere a diffuser can reduce the pressure behind the runner so increasing the actual stage heat drop and increasing stage efficiency. Axially symmetrical diffusers directly beyond the runner are best but the discharge flow is often irregular and then diffusers which operate well under uniform flow conditions are not always best. For instance, in practical tests a curved diffuser was found better than a conical one although static tests showed them to have equal performance. There are 7 figures.

ASSOCIATION: Moskovskiy energeticheskiy institut
(Moscow Power Engineering Institute)

Card 3/3

SHERSTYUK, A.N. (Moskva)

Approximate calculation of aerodynamic cascades. Izv.AN SSSR.Otd.tekh. nauk.Mekh. i mashinostr. no.5:39-45 S-O '62. (MIRA 15:10)
(Cascades (Fluid dynamics))

38996
S/096/62/000/007/001/002
E191/E435

AUTHORS: ~~Sherstyuk, A.N.~~, Candidate of Technical Sciences
Novoderezhkin, V.P., Engineer

TITLE: Contribution to the determination of velocities in an axial turbo-machine, taking into account the curvature of the streamlines in the axial cross-section

PERIODICAL: Teploenergetika, no.7, 1962, 50-53

TEXT: The problem has been solved in principle but the solution is laborious, requiring 2 sets of approximations. In the first approximation, the axial velocity components are determined from the given tangential components, ignoring the curvature of the streamlines in the axial cross-section. The continuity equations then yield the streamlines and their curvature. From this curvature, another approximation of the axial components is obtained. NASA Report No.955, 1950, contains an approximate formula for obtaining the second approximation streamlines from the first so that a third approximation is unnecessary, but the computations remain laborious. H. Petermann ("Konstruktion", 1, 1956) has given an approximate solution dispensing with

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S/096/62/000/007/001/002
E191/E435

Contribution to the determination ...

computed with and without consideration of streamline distortion, are compared. There are 3 figures.

ASSOCIATION: Moskovskiy energeticheskiy institut
(Moscow Power Engineering Institute)

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AM4016860 BOOK EXPLOITATION S/

Zaryankin, A. Ye.; Sherstyuk, A. N.

Low-power radial-axial turbines (Radial'no-osevy*ye turbiny* maloy moshchnosti) Moscow, Mashgiz, 1963. 248 p. illus., biblio. Errata slip inserted. 3000 copies printed. Reviewer: Professor G. S. Zhiritskiy; Managing ediotr: N. M. Zyugin; Publishing house editor: Engineer N. M. Paleyev; Technical editor: A. F. Uvarova; Proofreader: Ye. K. Shikunova; Cover artist: Ye. V. Beketova.

TOPIC TAGS: radial turbines, radial-axial turbines, low-power turbines, turbine stage, centripetal turbines, centrifugal turbines, turbine design, aerodynamic theory of turbines

PURPOSE AND COVERAGE: This book is intended for engineers and turbine specialists concerned with the design of radial-flow turbines. It also may be useful to students at power and machine-design vuzes in their study of turbine machinery. The fundamentals of the theory and design of radial- and radial-axial-flow turbines are presented. Special attention is paid to single-stage low-power radial-axial-flow turbines, which have found wide application in recent years.

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The book is based on the theoretical research of the authors and of other Russian and foreign specialists. It contains experimental material, basically that of the authors, on the testing of nozzle apparatuses and turbine stages and the influence of their geometry on the efficiency of stages. This book represents one of the first attempts to systematize the theory of radial-flow turbines, and contains only aerodynamic-design problems associated with radial-flow turbines. Engineer M. F. Zatsepin helped prepare paragraph 43, Chapter VII, and, together with Engineer Yu. N. Dineyev, assisted with the experimental work. Engineer L. B. Frolov was responsible for the development and application of the measurement apparatus.

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SUB CODE: AP, PR SUBMITTED: 20Apr63 NR REF SOV: 056

OTHER: 007 DATE ACQ: 17Jan64

Card 6/6

S/179/63/000/001/017/031
E031/E135

AUTHOR: Sherstyuk, A.N. (Moscow)

TITLE: On the calculation of blade cascades for subsonic velocities

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Mekhanika i mashinostroyeniye, no.1, 1963, 138-140

TEXT: The approximate method for calculating blade cascades for an incompressible fluid, described in an earlier paper of the author (Ref.1: Izv.AN SSSR, OTN, Energetika i avtomatika, no.5, 1962) is generalized to the case of a gas flow. The essential point is the calculation on the mean value of $(\operatorname{ctg}\beta)/\rho$ (where β is the angle between the relative velocity vector and the cascade generator, and ρ is the gas density):

$$\left(\frac{\operatorname{ctg}\beta}{\rho}\right)_m = \frac{1}{t}\int_0^t \frac{\operatorname{ctg}\beta}{\rho}\, dh_\infty \qquad (1.4)$$

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On the calculation of blade cascades... S/179/63/000/001/017/031
E031/E135

Subscript "∞" refers to flow for upstream of the cascade.
The mean value is determined by the method of successive approximations.
There is 1 figure.

SUBMITTED: September 7, 1962

Card 2/2

S/281/63/000/002/002/003
E191/E135

AUTHORS: Stepanov G.Yu., and Sherstyuk A.N. (Moscow)

TITLE: Contribution to the problem of determining the losses in plane turbine cascades at off-design entry angles

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Energetika i transport, no.2, 1963, 210-213

TEXT: A formula given earlier by A.N. Sherstyuk (Izv.AN SSSR, OTN, Energetika i avtomatika, no.2, 1960) and discussed by G.Yu. Stepanov (Izv. AN SSSR, OTN, Energetika i avtomatika, no.4, 1961) expresses the profile losses as a function of the entry and exit angles and has empirical coefficients. Minimum losses, according to this formula, occur at the design entry angle only when this is 90%. The choice of the coefficients depends on the definition of the exit angle and the choice of the design entry angle. If the exit angle is defined by the exit throat and the blade pitch, there are several methods for choosing the entry angle. One method is based purely on the blade shape (tangent to the mean line of the profile at the leading edge); another method defines

a hydrodynamic angle which corresponds to the smoothest velocity distribution. In the case of the TP-0A (TR-0A) cascade of the MEI, the geometric angle is 22% and the hydrodynamic, about 17%. Yet another definition is based on the entry throat and yields in the example chosen a value of 18%. Finally, the minimum loss angle can be defined. In the same example the latter is equal to the geometric angle. In other cases, the difference may reach 8%. Experimental data are compared with the empirical formula and it is concluded that, although agreement can be obtained by a choice of coefficients, the geometric definition of the design entry angle is to be preferred. The precise definition should be stated when experimental data are communicated. Empirical formulas are always confined to a narrow range of conditions.
There are 2 figures.

SUBMITTED: September 29, 1962

Card 2/2

SHERSTYUK, A.N.

Engineering method for calculating rectilinear channels. Trudy MEI no.47:17-24 '63.

Determination of losses in rotating blades of radial plates with actual entrance angles. Ibid.:25-30 (MIRA 17:1)

DMITRIYEVSKIY, V.I., doktor tekhn. nauk, prof.; ETINGOF, M.N., kand. tekhn. nauk; KUKINOV, A.G., kand. tekhn. nauk; BEKNEV, V.S., kand. tekhn. nauk; SHERSTYUK, A.N., kand. tekhn. nauk

Concerning K.F. Shpital'nik's book "Semigraphical methods for determining the parameters of air in a centrifugal compressor stage." Reviewed by V.I. Dmitrievskii and others. Teploenergetika 11 no.10:93-95 O '64. (MIRA 18:3)

1. TSentral'nyy ordena Lenina nauchno-issledovatel'skiy institut aviatsionnogo motorostroyeniya imeni P.I. Baranova (for Dmitriyevskiy, Etingof). 2. TSentral'nyy aerogidrodinamicheskiy institut imeni N.Ye. Zhukovskogo (for Kukinov). 3. Moskovskoye vysshoye tekhnicheskoye uchilishche (for Beknev). 4. Moskovskiy ordena Lenina energeticheskiy institut (for Sherstyuk).

L 22155-65 EPA/EWG(v)/EWT(l)/EWT(m)EWP(k)/EPA(bb)-2/T-2/EWP(w)/EWP(f)/EWP(v) Pe-5/
Pf-4/Pw-4 AEDC(b)/AEDC(a)/ASDF-3/ASDP-3/AFTCA/AFTC(p) EM/WW
ACCESSION NR: AP5002201 S/0096/65/000/001/0043/0047

AUTHORS: Sherstyuk, A. N. (Candidate of technical sciences); Sokolov, A. I. (Engineer); Lysenko, V. P. (Engineer)

TITLE: Investigation of axial-radial type compressors with blade diffusers

SOURCE: Teploenergetika, no. 1, 1965, 43-47

TOPIC TAGS: compressor, compressor blade, diffuser, compressor efficiency, blade size, blade shape/ N1 9 18 blade type, N 0 5 4 14 diffuser, N 0 5 4 18 diffuser, N 1 4 18 diffuser

ABSTRACT: Results of experimental investigations with blade diffuser-type compressors are reported. The purpose of the investigation was to study the effect of blade geometry on compressor efficiency. The flowing section of the compressor is given in Fig. 1 on the Enclosures. The details of the blade geometries (a total of 4 different types) are given in tabular form. All except N-1-9-18 blades were profiled. The compressor was operated at 25 000 r.p.m. and T = 293K. Its efficiency was defined by

$$\eta_a = \frac{\pi^{\frac{k-1}{k}} - 1}{\frac{T^*_{\kappa}}{T^*_{\text{н}}} - 1},$$

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L 22155-65

ACCESSION NR: AP5002201

where ε is the pressure ratio across the compressor and subscript H and K correspond to conditions before and after the compressor respectively. The type N-0.5-4-14 diffuser was investigated first by holding the number of blades z = 25 but varying the mounting angle. The results showed a maximum efficiency of 81% at $\alpha_{3H} = 16°20'$ (see Fig. 2 on the Enclosures). The second test was done by varying the number of blades. The optimum number was $z_H = 25\text{-}28$. The efficiency of the compressor with N-0.5-4-18 type diffuser was less than the N-0.5-4-14 diffuser by 1.5%. Analysis of the ratio a_4/a_3 for these two profiled diffusers (see Fig. 2) shows the limit $a_4/a_3 < 1.8\text{-}2.0$. Comparison of the efficiency of type N-1-4-18 compressor with variable b_3/b_2 showed almost no effect on the compressor efficiency in the range 1.12 to 0.87. Finally, the N-1-9-18 diffuser, which had the simplest blade geometry, showed an efficiency of only 0.7% less than the more complicated N-0.5-4-14 diffuser compressor. Orig. art. has: 8 figures, 1 formula, and 1 table.

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow Institute of Heat Power Engineering)

SUBMITTED: 00 ENCL: 02 SUB CODE: PR

NO REF SOV: 000 OTHER: 000

Card 2/4

L 54678-65 EPA/EWT(1)/EWP(f)/EWG(v)/T-2/EPA(bb)-2 Pe-5/Pw-4 NW

ACCESSION NR: AP5011577 UR/0143/65/000/004/0058/0065
621.515

32
31
B

AUTHOR: Sherstyuk, A. N. (Candidate of technical sciences, Docent); Sokolov, A. I. (Engineer); Lysenko, V. P. (Engineer)

TITLE: Determining the optimal width of bladeless diffusers of a single-stage centrifugal compressor

SOURCE: IVUZ. Energetika, no. 4, 1965, 58-65

TOPIC TAGS: compressor, centrifugal compressor, compressor diffuser

ABSTRACT: As the data available in the literature re the best width of a bladeless diffuser has not been definite, special experimental studies have been conducted to determine the optimal width of the diffuser in an axiradial centrifugal compressor. On the strength of theoretical considerations (later confirmed by experiments), the optimal b_3/b_2 should lie within 0.8—0.85, where b_3 is the diffuser width and b_2 is the impeller width. Tests at 25000 rpm were conducted

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L 54678-65
ACCESSION NR: AP5011577

with an 18-blade, 240-mm-impeller centrifugal compressor; b_2 = 16 mm. Five diffuser variants were tested. The test results permit drawing these conclusions: (1) Acceptance of the optimal b_3/b_2 enhances the compressor efficiency by 1.9% as compared to that with the conventional b_3/b_2 = 1; (2) The diffuser channel contraction should be made by deforming the front wall of the diffuser; (3) The gain in efficiency is attainable only if the channel outline in the meridian cross-section is smoothly (not sharply) curved. Orig. art. has: 6 figures and 19 formulas.

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow Power-Engineering Institute)

SUBMITTED: 12Mar64 ENCL: 00 SUB CODE: PR

NO REF SOV: 004 OTHER: 000

Card 2/2

L 52088-65 EPR/EPA(bb)-2/T-2/EWP(f)
ACCESSION NR: AP5015358

UR/0286/65/000/009/0103/0103
621.438-546

AUTHOR: Khanin, N. S.; Sherstyuk, A. N.; Dineyev, Yu. N.

TITLE: A turbine flow regulator. Class 46, No. 170787

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 9, 1965, 103

TOPIC TAGS: flow regulation, turbine engine, hydraulic device

ABSTRACT: This Author's Certificate introduces a turbine flow regulator made in the form of a movable diaphragm located in a spiral feed pipe. Hydraulic losses are reduced by locating the movable diaphragm above the outside edge of the working wheel.

ASSOCIATION: Tsentral'niy nauchno-issledovatel'skiy avtomobil'nyy i avtomotornyy institut (Central Scientific Research Institute of Automobiles and Automobile Engines)

SUBMITTED: 09Jul63 ENCL: 01 SUB CODE: PR

NO REF SOV: 000 OTHER: 000

Card 1/2

L 52088-65

ACCESSION NR: AP5015358

ENCLOSURE: 01

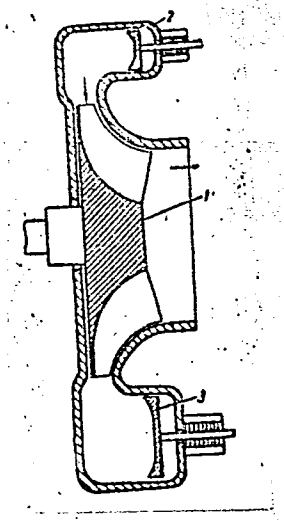

Fig. 1. 1--turbine; 2--feed pipe; 3--diaphragm

BJS

Card 2/2

SHERSTYUK, A.N., kand.tekhn.nauk; SOKOLOV, A.I., inzh.; LYSENKO, V.P., inzh.

Study of radial axial flow compressors with blade type diffusors.
Teploenergetika 12 no.1:43-47 Ja '65.
(MIRA 18 4)

1. Moskovskiy energeticheskiy institut.

L 2575-66 EPA/EWT(1)/EWT(m)/EWP(w)/EWP(f)/EWP(v)/T-2/EWP(k)/ETC(m) WW/EM

ACCESSION NR: AP5019294 UR/0143/65/000/007/0102/0105

542.78

AUTHOR: Sherstyuk, A. N. (Candidate of technical sciences, Docent); Sokolov, A. I. (Engineer); Lysenko, V. P. (Engineer)

TITLE: Investigation of the simple-contour blade diffusers of centrifugal compressors

SOURCE: IVUZ. Energetika, no. 7, 1965, 102-105

TOPIC TAGS: centrifugal compressor, diffuser performance

ABSTRACT: The results are reported of an experimental investigation of five diffuser variants having 23—26 blades and a_4/a_3 ratios of 1.74, 2.00, 2.25, and 2.45 (see Enclosure 1); the fifth blade variant had no bend in the inlet section. Blade width, 18 mm; impeller width, 16 mm. Compressor characteristics (ε and η_a plotted against flow) for different blade inlet angles and a_4/a_3 ratios, with all speeds reduced to 25000 rpm and at 293K, are shown. In the first series

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L 2575-66
ACCESSION NR: AP5019294

3

of tests, with the 23-blade impeller, an appreciable effect of the blade angle ($15^{\circ}30'$ to 18°) on the maximum compressor efficiency (80.5 to 77.5%) was detected. The second series of tests, with the 26-blade impeller, revealed that the effect of a_4/a_3 (1.75 to 2.5) on the maximum compressor efficiency is insignificant (80 to 80.7%). It was also found that the efficiency of one of the tested simple wedge-shape diffusers (no. 2) is only lower by 1% than that of a complicated-shape aerodynamically "perfect" diffuser. Orig. art. has: 4 figures.

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow Power-Engineering Institute)

#1.5

SUBMITTED: 03Sep64 ENCL: 01 SUB CODE: PR

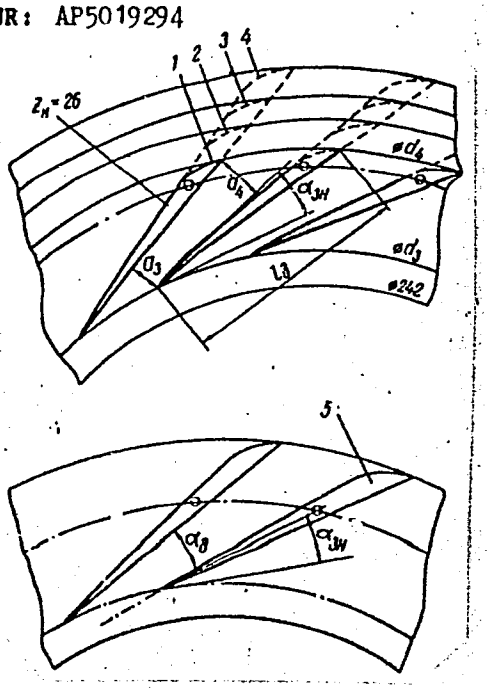
NO REF SOV: 001 OTHER: 000

Card 2/3

L 2575-66

ACCESSION NR: AP5019294

ENCLOSURE: 01



Variants of tested diffusers

Card 3/3

L 10233-66 EPA/EWT(m)/EWP(w)/EWP(f)/EWP(v)/T-2/EWP(k)/ETC(m) WW/EM

ACC NR: AP6003192 SOURCE CODE: UR/0147/65/000/004/0125/0132

AUTHOR: Sherstyuk, A. N.; Zaychenko, Ye. N.; Aboltin, E. V.; Kriger, V. A. 49

ORG: none B

TITLE: Effect of the number of rotor blades 26 on the characteristics of a mixed-flow compressor 27

SOURCE: IVUZ. Aviatsionnaya tekhnika, no. 4, 1965, 125-132

TOPIC TAGS: compressor, mixed flow compressor, compressor design, compressor blade

ABSTRACT: A series of experiments were conducted to determine the effect of the number of blades on the performance characteristics of a mixed-flow compressor with an exit blade angle of 90°. The obtained results show that for a compressor with a rotor diameter on the order of 130 mm, the optimum number of blades is about 14. A reduction in the number of blades results in an increase in the optimum discharge coefficient ϕ. For example, when the number of blades is reduced from 14 to 4, ϕ increases from 0.23 to 0.25. This increase is due to the decrease in the angle of attack, since the latter is directly proportional to the number of blades. The presented curves can be used to calculate compressor performance characteristics. Orig. art. has: 6 figures and 5 formulas. [AS]

SUB CODE: 13/ SUBM DATE: 02Dec64/ ORIG REF: 003/ ATD PRESS: 4174

Card HW 1/1

KHANIN, N.S.; SHERSTYUK, A.N.; ZAYCHENKO, Ye.N.; DINEYEV, Yu.N.; PORTNOV, D.A., doktor tekhn.nauk, prof., retsenzent

[Supercharging and superchargers of motor-vehicle engines] Nadduv i nagnetateli avtomobil'nykh dvigatelei. Moskva, Mashinostroenie, 1965. 221 p. (MIRA 18:8)

GRIN'KO, S.V.; KRIVCHIK, P.T.; CHEBANENKO, P.K.; SHCHERBAK, I.P.; SHERSTYUK, A.S., red.; ALEKSEYEV, V., tekhn. red.

[The Dnieper Hydroelectric Power Station a first step in the industrialization of the country; collection of documents on the construction of V.I.Lenin Dnieper Hydroelectric Power Station, 1926-1932] Pervenets industrializatsii strany - Dneproges imeni V.I.Lenina; sbornik dolumentov o stroitel'stve Dneprogesa im. V.I.Lenina 1926-1932gg. Zaporozh'e, Zaporozhskoe knizhnoe izd-vo, 1960. 286 p. (MIRA 14:11)

1. Kommunisticheskaya partiya Ukrayny. Zaporozhskiy oblastnoy komitet. Partiynyy arkhiv.

(Dnieper Hydroelectric Power Station)

BRICHKIN, A.V.; BELENKO, N.P., inzh.; SHERSTYUK, B.F., inzh.

Parameters of the supersonic gas jet in thermal drilling. Izv. vys. ucheb. zav.; gor. zhur. 5 no.1:90-97 '62. (MIRA 15:4)

1. Kazakhskiy politekhnicheskiy institut. Rekomendovana kafedroy razrabotki rudnykh mestorozhdeniy Kazakhskogo politekhnicheskogo instituta. 2. Chlen-korrespondent AN Kazakhskoy SSR (for Brichkin).

(Boring--Equipment and supplies) (Jets)

BRICHKIN, A.V., prof., doktor tekhn.nauk; BELENKO, N.P., kand.tekhn.nauk; BOLOTOV, A.V., inzh.; GENBACH, A.N., inzh.; SHAMIN, P.A., kand. tekhn.nauk; SHERSTYUK, B.F., inzh.

Experimental studies of the parameters of the stream of a jet-piercing burner. Izv. vys. ucheb. zav.; gor. zhur. 6 no.3: 52-58 '63. (MIRA 16:10)

1. Kazakhskiy politekhnicheskiy institut. Rekomendovana kafedroy razrabotki rudnykh mestorozhdeniy. 2. Chlen-korrespondent AN KazSSR (for Brichkin).

L 12791-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD
ACCESSION NR: AP3000782 S/0070/63/008/003/0456/0459

AUTHOR: Kosty*lev, S. A.; Sherstyak, B. N.

TITLE: Electron-diffraction studies on the structure of sublimated films of ZnS and ZnS-Mn

SOURCE: Kristallografiya, v. 8, no. 3, 1963, 456-459

TOPIC TAGS: x-ray diffraction, sublimated films, Zns, Mn, photoluminescence, electroluminescence, phosphor

ABSTRACT: This study of sublimated films was undertaken because of the prevalence of impurities in larger masses. Films of Zns and Zns-Mn were prepared in a high vacuum (10 sub -5 mm mercury) from powdered ZnS pressed into a disk and heated in the vacuum at 1100C. Tests on the films showed that the brightness of electroluminescence did not increase on raising the heating temperature above 550C or on holding the specimen at the high temperature for more than 10 minutes. The brightness did increase with voltage, however, and the authors conclude that this corresponds to a certain degree of disordering in the lattice. To test this and to verify the belief that the structures of thick and thin films are alike, they made x-ray diffraction studies of a 2-micron-thick sublimate-phosphor of ZnS-Mn and of the initial material. It was found that the x-ray pattern of the initial

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