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ABSTRACTS OF PUBLISHED ARTICLES

UDC 678.067:629.12.011.74

Polymeric composites with reinforcement complex structures for curved large-sized casings matching the metals in strength. F r o l o v S. Ye. – Problems of Materials Science, 2002, N 3(31), p. 7–19

An approximate analytical description of irregular curved vessel hulls casings out of polymeric composites is given. A calculation method of casings surface homogeneous coating with reinforced material clothes by compact layers along the longitudinal structure is carried out. Method of sectional-solid formation of large-sized casings with butt joints, the strength of which is almost equal to one of solid material, is studied. Parameters of environmentally safe formation of large-sized casings and control methods of a process of toxic volatile compounds extraction from polyether binder are determined.

Key words: polymeric composites, homogeneous reinforcement, curved vessel hulls casings, sectional-solid formation, environmentally safety.

UDC 678.067:534.013

Effect of structures parameters on eigenfrequencies and loss factors of anisotropic polymer composite plates. Y a r t s e v B. A. – Problems of Materials Science, 2002, N 3(31), p. 19–31

Influence of ply stocking on eigenfrequencies and loss factors of coupling vibrations of symmetrical and antisymmetrical layered anisotropic composite plates is investigated. Possibility dissipative and resonance parameters control of these structures in wide frequency range by change of layer material anisotropy rate, ply orientations and structures inhomogeneous is presented.

Key words: polymer composites, elastic characteristics, dissipative characteristics, bending vibrations, twisting vibrations, natural frequencies, loss factors.

UDC 678.067:620.178.53

Calculation of effective elastic and damping characteristics of hybrid polymer composites. G o r e v Yu. A., Y a r t s e v B. A. – Problems of Materials Science, 2002, N 3(31), p. 31–39

The method for determination of elastic and dissipative properties of hybrid polymer composite materials based on calculation data of eigenfrequencies and loss factors of bending, twisting and bending-twisting vibrations of rectangular cross-section bars is described. The convergence estimation of the elaborated mathematical description is shown.

Key words: hybrid polymer composites, elastic characteristics, dissipative characteristics, bending vibrations, twisting vibrations, natural frequencies, loss factors.

UDC 678.067:539.538:620.178.162

Tribotechnical express-tests technology of antifriction polymers. T o c h i l n i k o v D. G., G i n s b u r g B. M.– Problems of Materials Science, 2002, N 3(31), p. 39–48

The technology of tribotechnical express-tests for tribological characteristics determination of antifriction polymers is carried out according to 5 diagrams.

Key words: antifriction carbon plastic, tribotechnical express-tests, tribotechnical characteristics, calculation methods.

UDC 678.067:621.891:620.178.162

Tribotechnical express-tests of antifriction polymeric materials with water lubricated friction. A b o s i n I. Yu., B a k h a r e v a V. Ye., G i n s b u r g B. M., R y b i n V. V., T o c h i l n i k o v D. G. – Problems of Materials Science, 2002, N 3(31), p. 49–58

Tribotechnical properties of antifriction carbon plastics УГЭТ and ФУТ, caprolon B, Tordon XL, fluorinplastic with water lubricated friction (sliding speed 1 m/c) in wide range of contact pressures are studied. High wear resistance of antifriction carbon plastics is noticed.

Key words: antifriction carbon plastics, friction coefficient, wear-out rate, working pressure.

UDC 678.067:539.538:620.178.162

Tribotechnical express-tests of antifriction polymeric materials by working without lubrication. A b o s i n I. Yu., B a k h a r e v a V. Ye., G i n s b u r g B. M., R y b i n V. V., T o c h i l n i k o v D. G. – Problems of Materials Science, N 3(31), p. 58–68

Tribotechnical characteristics of antifriction carbon plastics – epoxy (УГЭТ), phenolic (ФУТ), polyimidic (ИТА-31 and ИДА) and Tordon thermoplastic – are studied. The operation opportunity of carbon plastics УГЭТ and ФУТ in slow nodes of dry friction is established. The advantages of these carbon plastics over foreign Tordon analogue are shown.

Key words: antifriction polymeric materials, tribotechnical express-tests, dry friction, wear-out rate, friction coefficient.

UDC 678.067:539.538

Tribotechnical parameters of modified carbon plastics. A b o s i n I. Yu., B a k h a r e v a B. Ye., G i n s b u r g B. M., T o c h i l n i k o v D. G. – Problems of Materials Science, 2002, N 3(31), p. 68–72

Effect of fluorineplastic-modifier on tribotechnical parameters of carbon plastics with dry friction and with water lubricated friction is studied.

Key words: modified carbon plastics, dry friction, water lubricated friction, tribotechnical parameters.

UDC 678.067:621.891:620.178.162

Research of counterbody's material influence on tribotechnical indices of carbon plastics with water lubricated friction. Anisimov A. V., Bakhareva V. Ye., Panfilov N. A., Ginsburg B. M., Tochilnikov D. G. – Problems of Materials Science, 2002, N 3(31), p. 73–77

The results of bench tribotechnical tests in JSC “Leningrad metallic works” are presented. The carbon plastic ФУТ-Ф together with bronze Бр.О5Ц5С5 and the carbon plastic УГЭТ-Ф together with steel 20Х13 excel the previously applied materials in tribotechnical properties and are recommended for use in faced seal construction of hydraulic turbine shaft and in friction nodes construction of hydraulic turbine guide apparatus.

Key words: antifriction modified carbon plastics, friction nodes, hydraulic turbine, tribotechnical tests, faced seal, bronze.

UDC 678.067:539.538:620.178.162

Bench tribotechnical tests of antifriction modified carbon plastics for friction nodes of hydraulic turbines. Anisimov A. V., Bakhareva V. Ye., Chernigovsky A. A. – Problems of Materials Science, N 3(31), p. 78–83

The results of bench tribotechnical tests of carbon plastic ФУТ-Ф with friction with bronze Бр.О5Ц5С5 and carbon plastic УГЭТ-Ф with steel 20Х13 are given. These carbon plastics excel the previously applied materials in tribotechnical properties and are recommended for use in faced seal construction of hydraulic turbine shaft and in friction nodes construction of hydraulic turbine guide apparatus.

Key words: antifriction modified carbon plastics, friction nodes, hydraulic turbine, tribotechnical tests, faced seal.

UDC 678.067:539.538:621.822.5

Antifriction carbon plastics application in hydraulic turbines. Pekler K. V., Panfilov N. A., Abosin I. Yu., Bakhareva V. Ye. – Problems of Materials Science, 2002, N 3(31), p. 83–87

The experience of antifriction carbon plastics application for sliding bearings of hydraulic turbines guide apparatus and for faced seal of hydraulic turbines shafts is generalized.

The use of antifriction carbon plastics for sliding bearings allowed their service life to be increased 1,5–2 times in comparison to one of bearings out of metallic alloys and the degree of environment contamination to be decreased due to avoiding of oil lubrication of friction nodes.

Key words: antifriction carbon plastic, sliding bearing, faced seal, hydraulic turbine.

UDC 678.067:539.538:621.822

The antifriction carbon plastic ФУТ application in centrifugal pumps produced by ФГУП ГПО “Votkinsky works”. Velezhnin V. S. – Problems of Materials Science, 2002, N 2(30), p. 88–91

The possibility of application of high-speed (under sliding speeds till 25 m/c) build-in bearings out of antifriction carbon plastic ФУТ in centrifugal pumps is studied.

Key words: antifriction carbon plastic, high-speed bearing, vibradamping characteristics.

UDC 678.067:621.891:621.822

Composition and construction optimization of deadwood bearings out of ФУТ-7. S o k o v Ye. V.– Problems of Materials Science, 2002, N 2(30), p. 92–103

Optimal tribotechnical parameters of ФУТ-7 composition: phenol carbon plastic of ФУТ grade and graphite-reinforced fluorineplastic compositions Anita-40 are determined. The materials are applied in deadwood friction with hercules bronze of Бр.О10Ц2 grade, with water lubrication.

Key words: deadwood bearings, ФУТ-7 composition, hercules bronze of Бр.О10Ц2 grade, friction pair, water lubrication, tribotechnical parameters.

UDC 678.067:621.99

Rheological model of carbon plastics fracture with tool edge cutting. P e t r o v V. M. – Problems of Materials Science, 2002, N 3(31), p. 104–110

Peculiarities and mechanisms of fracture and chip formation process of carbon plastics with tool edge cutting are studied to create models of mechanical blade treatment process, which give an opportunity to determine exactly the spheres of stable treatment with prearranged conditions, manufacturing, and required quality of finished parts surface layer.

The studies showed, that precision and roughness of treated surface of parts out of carbon plastic greatly depend on work piece receipt technologies, mechanical treatment parameters, hardness, geometry and cutting tool grade.

Key words: carbon plastics, mechanical treatment, cutting tool edge, fracture model.

UDC 678.067.5:621.355

Attachment points of vessel batteries out of glass-reinforced plastic. P a n f i l o v N. A., A b o s i n I. Yu., K u l m i s L. M., S i m i n a V. N. – Problems of Materials Science, 2002, N 3(31), p. 110–117

The presented construction of battery attachment points with one-directed glass-reinforced plastic application has great advantages in accumulate compartment occupied volume, in electric resistance quality and corrosion resistance over foreign and home analogue. Hardness with static tension and shock resistance of attachment points exceed several times the required meanings.

Key words: glass-reinforced plastic, attachment points, battery, shock resistance.

UDC 620.193.013:624.012.45

Electrochemical protection of concrete reinforced constructions in sea water. K u s m i n Yu. L., M e d a n i c T. Ye., R o t z L. D. – Problems of Materials Science, 2002, N 3(31), p. 118–125

According to requirements of application on sea reinforced concrete constructions the facilities of electrochemical protection from corrosion based on abundant materials with low anodic solubility are created and the method of their installation in concrete is carried out.

By result of electrochemical characteristics studies and working peculiarities in wet concrete sphere the protection optimal parameters are established, calculation methods and application requirements of electrochemical cathodic and sacrificial protection systems with the constructions operation in different sea pools.

Key words: sea concrete reinforced constructions, steel reinforcement, systems of corrosion electrochemical protection, protective potential.