

Finished plasma strengthening and restoration of fuel equipment details

Topolyansky P., Sharifullin S., Adigamov N., Ermakov S., Topolyansky A.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2018 Institute of Physics Publishing. All rights reserved. The results of the investigation of the physical and mechanical properties of diamond-like coatings of the DLC Pateks type (a-C: H / a-SiOCN) obtained on friction surfaces by transporting the atomic and molecular flux of vapor particles of liquid chemical compounds by a plasma jet of an arc plasma torch of atmospheric pressure are presented. The layer formed on the working surfaces is a non-metallic amorphous multilayer coating with a low coefficient of friction, increased microhardness, chemical inertness, hydrophilicity, high heat resistance and dielectric characteristics. To minimize the possible defectiveness of the main material, it is proposed to apply thin-film coatings to them at the final stage of manufacturing fuel equipment parts.

<http://dx.doi.org/10.1088/1742-6596/1058/1/012075>

References

- [1] Topolyansky P.A. 2010 Application of international standards to assess the properties of surfaces subject to wear Technology of mechanical engineering 6 ed P.A. Topolyansky, A.P. Topolyansky, N.A. Sosnin and S.A. Ermakov 56-60
- [2] Kanaev A.T. 2017 Certification of materials and coatings for micro abrasive wear parameters Bulletin of Science of the Kazakh Agrotechnical University. S. Seifullin 2 ed A.T. Kanaev, P.A. Topolyansky, S.A. Ermakov and A.P. Topolyansky 111-119
- [3] Topolyansky P.A. 2016 Testing of tribological coatings for micro abrasive wear Mechanics and tribology of transport systems. Rostov on-Don, on 8-10.11.2016: in 2 tons - Rostov-on-Don: FGBOU IN RGUPS 2 ed P.A. Topolyansky, S.A. Ermakov and A.P. Topolyansky 217-223
- [4] Adigamov N.R. 2016 Plasma technologies in increasing the efficiency of high-pressure fuel pumps of diesel engines Welding production 2 ed N.R. Adigamov, V.P. Lyalakin, R.Yu Soloviev and S.N. Sharifullin 49-51
- [5] Sharifullin S N and Pirogova A S 2017 J. Phys.: Conf. Series 789 012051
- [6] Solovev R Y, Sharifullin S N and Adigamov N R 2016 J. Phys.: Conf. Series 669 012050
- [7] Sharifullin S N and Dunayev AV 2016 IOP Conf. Series: Mater. Sci. Eng. 134 012025
- [8] Dounaev A. and Sharifullin S. 2014 Friction surfaces modification using tribo-compounds World Applied Sciences Journal 31 272-276
- [9] Sharifullin S N, Adigamov N R, Adigamov N N, Solovev R Y and Arakcheeva K S 2016 J. Phys.: Conf. Series 669 012049
- [10] Kadyrmetov A M, Sharifullin S N and Maltsev A F 2016 J. Phys.: Conf. Series 134 012009
- [11] Sagin S.V. 2013 Tribotechnical processes occurring in the fuel equipment of high pressure marine diesel engines Glimpses of technology 2 ed S.V. Sagin 33-42
- [12] Bodrov A.S. 2017 Investigation of the causes of failure of the needle of the atomizer of diesel fuel injectors Problems of research of systems and means of motor transport. Materials MNTC 1 ed A.S. Bodrov, A.A. Katunin and A.S. Markin 34-40 Tula

- [13] Timofeev S.S. 2010 increase of wear resistance of plunger pairs. Surface engineering and renovation of products Proceedings of 10-th international science-technical conference (Kyiv, May 24-28, 2010) ed S.S. Timofeev 194-196 ATM of Ukraine
- [14] Timofeev S.S. 2006 surface Engineering and renovation of products. Materials of the 6th international scientific and technical conference ed S.S. Timofeev, A.Y. Movshovich and V.N. Ostapchuk (Yalta-Kiev) Improvement of wear resistance of parts of fuel equipment of diesel engines 143-145 30.05-01.06
- [15] Lebedev A.T. 2010 Recovery of the plunger Mechanization and electrification of agriculture 1 ed A.T. Lebedev and P.A. Lebedev 23-24
- [16] Gaidar S.M. 2010 Restoration of the operating parameters of plunger pairs and improving the reliability of the fuel system of diesel engines The international technical-economic journal 1 ed S.M. Gaidar 54-58
- [17] Skoblo T.S. 2015 A study of the influence of ultradispersed diamonds with the restoration and hardening of parts of the nodes of fuel equipment Problems of Tribology 1 ed T.S. Skoblo, O. Y. Klochko, A.I. Sidorenko, A.V. Plugatarev and A.K. Olejnik 106-111
- [18] Jackin C. S. 2015 Proceedings of GOSNITI 119 ed S.U. Jacquin, M.N. Krasnova, N.A. Pen'kov and A.I. Krasnov (Moscow) Increase of adhesion of electroplated composite coatings used in the restoration plunger pairs fuel pump 54-60
- [19] Gabitov I.I. 2017 Hardening of valve assemblies electro-hydraulic injectors of diesel engines at repair Hardening technology and coatings 7 ed I.I. Gabitov, R.N. Saifullin and A.R. Valiev 328-335
- [20] Hershberger J. 2004 Evaluation of DLC coatings for spark-ignited, direct-injected fuel systems Surface and Coatings Technology 179 ed J. Hershberger, O. Ozturk, O.O. Ajayi, J.B. Woodford, A. Erdemir, R.A. Erck and G.R. Fenske 237-244