
Synthesis of the nanostructured composite ceramic-polymer functional coatings for the face seals

N.N. Andrianova¹, A.M. Borisov¹, R.V. Zheltukhin¹,
A.V. Kosogorov², B.L. Krit¹,
N.V. Morozova⁴, I.A. Ryzhikov³, N.L. Semyonova¹, I.V. Suminov¹,
A.V. Apelfeld¹

¹ MATI — Russian State Technological University n.a. K.E. Tsiolkovsky, Moscow, 121552, Russia

² Bauman Moscow State Technical University, Moscow, 105005, Russia

³ Institute for Theoretical and Applied Electromagnetics RAS, Moscow, 125412, Russia

⁴ Russian Medical Academy of Postgraduate Education, Moscow, 123995, Russia

Microarc oxidizing of aluminum alloy AMg-3 with the subsequent filling by the vapor deposition polymerization of poly-p-xylene is carried out. It is established that the formation of a polymeric covering allows to reduce residual through-porosity of MAO-coverings more than by five times. Microarc oxidizing in a combination with vapor deposition polymerization can form a basis for the development of surface synthesis technology of the nanostructured composite ceramic-polymer coverings for the face consolidations mechanisms which are made from light, inexpensive and available metals and alloys.

Keywords: face seals, microarc oxidizing (MAO), ceramics-polymeric coatings

Andrianova N.N. (b. 1982) graduated from MATI — Russian State Technological University n.a. K.E. Tsiolkovsky in 2005. Ph.D, Assoc. Professor of MATI — Russian State Technological University n.a. K.E. Tsiolkovsky. e-mail: andrianova_nn@mail.ru

Borisov A.M. (b. 1952) graduated from Lomonosov Moscow State University in 1976. Dr. Sci. (Phys.&Math.), Professor of MATI — Russian State Technological University n.a. K.E. Tsiolkovsky. e-mail anatoly_borisov@mail.ru

Zheltukhin R.V. (b. 1980) graduated from MATI — Russian State Technological University n.a. K.E. Tsiolkovsky in 2003. Senior Lecturer of MATI — Russian State Technological University n.a. K.E. Tsiolkovsky. e-mail: tompve-2005@yandex.ru

Kosogorov A.V. (b. 1951) graduated from Bauman Moscow Higher Technical School in 1974. Ph.D., Assoc. Professor of the Physics Department of Bauman Moscow State Technical University. e-mail: kosogorov.a@yandex.ru

Krit B.L. (b. 1957) graduated from Moscow Steel and Alloys Institute in 1981. Dr. Sci. (Eng.), Professor of MATI — Russian State Technological University n.a. K.E. Tsiolkovsky. e-mail: bkrit@mail.ru

Morozova N.V. (b. 1968) graduated from Moscow Psychology-Social Institute in 2001. Ph.D., Assoc. Professor of the Russian Medical Academy of Postgraduate Education. e-mail: innat.m@mail.ru

Ryzhikov I.A. (b. 1955) Ph.D., Head of the Laboratory of the Institute for Theoretical and Applied Electromagnetics RAS. e-mail: nanocom@yandex.ru

Semyonova N.L. (b. 1962) Ph.D., Senior Lecturer of MATI — Russian State Technological University n.a. K.E. Tsiolkovsky.

Suminov I.V. (b. 1958) graduated from MATI — Russian State Technological University n.a. K.E.Tsiolkovsky in 2005. Dr. Sci. (Eng.), Professor, Vice Rector for Scientific Work of MATI — Russian State Technological University n.a. K.E. Tsiolkovsky. e-mail: tompve-2005@yandex.ru

Apelfeld A.V. (b. 1959) graduated from the Moscow Steel and Alloys Institute in 1981. Dr. Sci. (Eng.), Professor of MATI — Russian State Technological University n.a. K.E. Tsiolkovsky. e-mail: tompve-2005@yandex.ru
