

Use of Microscopy for Morphology Analysis of Wear Particles Generated in the Fuel Systems of Internal Combustion Engine

Zdeněk Aleš¹, Jindřich Pavlů¹, Jaroslava Svobodová², Martin Pexa¹

¹Faculty of Engineering, Czech University of Life Sciences Prague, Czech Republic. E-mail: ales@tf.czu.cz, pavluj@tf.czu.cz, pexa@tf.czu.cz

²Faculty of production technology and management, Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republic. E-mail: svobodova@fvtn.ujep.cz

Microscopy is nowadays applied in different research disciplines. It is widely used in the field of tribology and its application to technical systems. Microscopy is able to analyze morphology of wear particles generated in various technical systems of vehicles. Wear particles are formed not only in lubricating systems, but also in fuel systems. Number of wear particles and their morphology consequently accelerate the process and the intensity of wear. Quite frequently mentioned problem is impact of biofuels or other fluids on their technical condition. Newly produced biofuels may lead to increased wear of the fuel injection system due to reduced lubrication capability compared to conventional fuel. Their presence in fuel systems may accelerate wear and eventually may cause failure. Article describes laboratory experiments focused on influence of various fuels on functional surfaces of fuel injection system parts from the perspective of scanning electron microscopy. The aim of the experiment was to prove or disapprove hypothesis that there is significant impact of biobutanol on creation of wear particles of fuel injection system. The results showed that biobutanol has a lower lubricating ability to form sufficient layer in order to prevent increased wear.

Keywords: Scanning Electron Microscopy, Reichert tester, Wear Particles Morphology

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