Influence of Additives Processed by Physical Fields on Tribotechnical Properties of Polymer Composites

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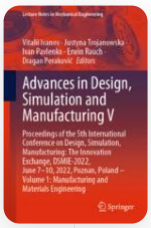

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Vitalii Kashytskyi, Oksana Sadova, Mykola Melnychuk, Petro Savchuk & Oleksandr Liushuk

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Abstract

The influence of specific load on the intensity of weight and linear wear is determined in the article. The coefficient of friction and temperature in the zone of tribocontact of polymer composites, the components of which were processed in physical fields, were studied. The study of polymer composites with different content of components carried out at a constant sliding speed of 0.5 m/s. Epoxy resin and polyethylene polyamine hardener were used as a matrix to form polymer composites. To ensure increased heat resistance of the polymer matrix, a modifying additive (organosilicon varnish) was used. For the first time, the processing of organosilicon varnish in an electromagnetic field was applied, which allowed removing part of the solvent. Discrete aramid and glass fibers were used as reinforcing additives. For the first time, ultrasonic treatment of fibers in acetone was used, which allowed cleaning the surface of the fibers from contaminants and lubrications. Because of the use of the modifying additive and treated discrete fibers, the wear resistance of polymer composites increased by 30% due to the improvement of the adhesive interaction between the components of the system and the reduction of structural defects of the material. Removal of lubrication from the surface of the fibers and the solvent from the modifying additive increased by 0.1–0.15 the coefficient of friction of the polymer composites and will improve their service life. Friction polymer composite materials with high density and improved tribotechnical properties are designed for manufacturing brake systems of scooters.

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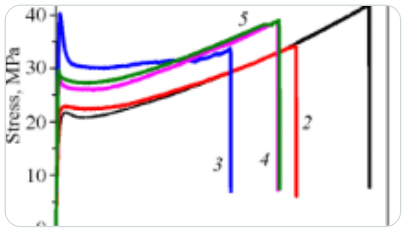

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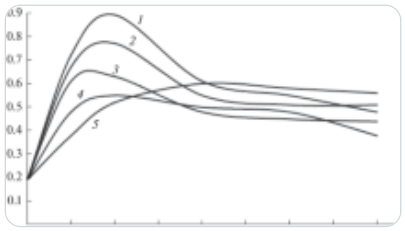

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Author information

Authors and Affiliations

Lutsk National Technical University, 75, Lvivska Street, Lutsk, 43018, Ukraine
Vitalii Kashytskyi, Oksana Sadova, Mykola Melnychuk, Petro Savchuk & Oleksandr Liushuk

Corresponding author

Correspondence to Vitalii Kashytskyi.

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