MODELING PARAMETERS FOR ANTIWEAR COATING TOPOGRAHPIES

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Protective coatings are widely used to increase wear resistance and capacity of elements of constructions that function under heavy load. To calculate deflected mode of construction elements that have complex geometric shapes and operate under extreme conditions, up-to-date calculating methods are used, including finite element method which is an effective tool for solving different engineering tasks and plays a leading role in forecasting construction element capacity.

Capacity of heavy-duty friction pairs can be increased by improving surface structure by covering working surfaces with protective antiwear coating.

The goal of this work is to determine parameters for antiwear coating that decrease the possibility of coating adhesive detachment from the base under heavy load.

During exploitation, traditional solid coatings lose their cohesion and adhesion durability, i.e. fissure and detach from the base. Coating destruction can be prevented by creating a special typography of surface, i.e. by forming discrete coatings.

Creating discrete rational-sized sections (taking into account deflected mode of the surface) allows to prevent cohesive fissuring and adhesive delamination. In addition, such coatings increase durability of working surfaces by creating secondary structures that linger in inter-discrete spaces and serve as a lubricant.

Modeling surface modified by electrospark alloyage (such as elastic surface) that contain discrete surface areas by using a method of initial parameters, we find expressions for deflections that occur on the surface area under external load. By analyzing elastic line dependencies we select such parameters of discrete area that allow to prevent destruction of surface layer due to adhesive delamination of coating.

The suggested method for hardening working surfaces of heavy-loaded working pairs consists in creating an impulse electric discharge of a certain topography of a modified surface discrete layer (under the condition of exclusion of cohesive fissuring, minimum stress concentration and restriction of permissible stress) provides reliability of coating and allows to increase capacity of friction pairs.