

V. S. Antonyuk, E. B. Soroka, and V. I. Kalinichenko. Providing Adhesion Strength for a Substrate-Coating System under Contact Loading. – Journal of Superhard Materials. Vol. 30, No 2. pp. 133-138, 2008

The use of graded coatings, with elastic moduli decreasing gradually from the contact surface to the substrate, is shown to result in considerably reduced stresses at the coating—substrate interface under indentation and friction and sliding contacts subjected to surface loading. When solving a contact problem, the researchers have demonstrated that the stress distribution pattern, including stresses at the substrate—coating interface, as well as the coating thickness parameters and elastic characteristics depend on the contact plane and relative surface area of the loading zones. The case under study here differs fundamentally from those discussed in the available publications, not so much in considering a coated tool as in the fact that the contact discontinuity depends also on the dimensions of the discrete coating segment. This requires taking up and considering a problem of contact loading of a discrete coating segment on a tool. The objective of the present work is to minimize stresses in the substrate—coating adhesive contact under contact loading with friction.

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