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### **Some Remarks on tribotesting of surface modified elements**

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There are many successful applications of thin hard PVD/CVD coatings in various technical devices like engines, pumps, compressors. But the problem of application of such coatings for heavy-loaded friction parts (eg. gears, bearings) is still open - the share of mechanical components that are coated is extremely small (less than 2%).

The service life of heavy-loaded machine parts is essentially determined by two types of tribological failures: scuffing which is a severe form of mechanical wear, and pitting which is a surface fatigue phenomenon.

It has been proven that thin hard coatings, similar to those used for tools, reduce the risk of scuffing and do not require environmentally dangerous additives in lubricating media. It has been confirmed by various researchers in bench and component tests. The authors work out the four-ball method with continuously increasing load for assessment of scuffing phenomena of coated tribosystem. A new method for testing under conditions of scuffing gives a good resolution and is fast and cheap.

The next problem is pitting. Comprehensive research on rolling contact fatigue indicates that steel components with typical PVD/CVD coatings usually do not exhibit a satisfactory fatigue life. However the results obtained for a new coating are encouraged.

The fatigue behavior depends on a number of factors and their influence on this phenomenon is very far from clear. The authors present a new method for assessment of rolling contact fatigue of PVD/CVD coated elements in lubricated contacts. The method exhibits good resolution and is time and cost effective. It was successfully applied to investigating various types of surface coatings among other single, multilayer and duplex ones.