

The Effective Use of Composite Boride Coating to Improve the Tribological Properties of Machine Elements and Cutting Tools¹

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Abstract

Composite boride coating process is considered, one of the techniques in surface treatment, that recently used to improve the mechanical and tribological properties of the cutting tools and machine elements, that are exposed to wear and corrosion.

The results show that the surface treatment by using the composite boride coating will form boride layers with a high surface hardness, good wear resistant; also they will save low friction coefficient, and a high corrosion resistance .

The tribological properties of materials were studied using surface treatment by composite boride coating according to structure and compounding, and under different-friction circumstances, especially; dry friction under effect of the abrasive elements, friction in corrosive environments, and other materials that are exposed only to hardness.

Research shows that the composite boride coating has a strong and important effect on the ability of machine elements to work during dry friction or friction in corrosive environments. This influences the friction layer stability and the formation of a secondary ball-shaped structure that consists of different Boron oxides and other combinations are working as a lubricant to the friction pair

Keywords: Steel, composite boride coating, surface treatment, friction; wear and corrosion, micro hardness and tribological properties.

¹ For the paper in Arabic see pages (379-398).

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