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Influence of glow plasma Co-based alloying layer on sliding wear and fretting wear resistance of titanium alloy

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Abstract

The tribological properties of a Ti6Al4V alloy surface were improved via glow plasma alloying with Co-based alloys. The influence of different target geometries on the thickness of these layers, the sliding and fretting wear resistance as well as the tribological mechanism of the coatings were determined. The low friction coefficient as well as the good fatigue wear, abrasive wear, and adhesive wear resistance of CoCrW layer were attributed to its high toughness, excellent loading capability, appropriate thickness, and high hardness. Furthermore, the CoCrMo layer had lower toughness and loading capability than CoCrW; therefore, the CoCrMo alloyed layer exhibited better sliding wear resistance, but poor fretting wear resistance.

Key words: Titanium alloy; Glow plasma surface alloying; Co-based alloy; tribological property

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