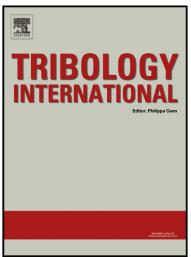
Author's Accepted Manuscript

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www.elsevier.com/locate/triboint

PII: S0301-679X(14)00341-7

DOI: http://dx.doi.org/10.1016/j.triboint.2014.09.017

Reference: JTRI3444

To appear in: Tribology International

Received date: 28 June 2014 Revised date: 26 August 2014 Accepted date: 16 September 2014

Cite this article as: Dongqing He, Shaoxian Zheng, Jibin Pu, Guangan Zhang, Litian Hu, Improving tribological properties of titanium alloys by combining laser surface texturing and diamond-like carbon film, *Tribology International*, http://dx.doi.org/10.1016/j.triboint.2014.09.017

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Improving tribological properties of titanium alloys by combining laser surface

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Abstract

Titanium alloys are characterized by poor tribological performance, and their

conventional use has been restricted to non-tribological applications. Surface films

and surface texturing are effective methods to improve the tribological properties of

sliding surfaces. In this study, the patterns of micro-dimples with different densities

and diamond-like carbon (DLC) films were fabricated on the surface of titanium alloy

by laser surface texturing and magnetron sputtering, respectively. The effects of

dimple densities and DLC phase transformation on the tribological behavior of the

titanium alloy under dry friction and liquid lubrication conditions were investigated.

The results showed that DLC film with appropriate dimple area density (44%) are

effective in enhancing reducing-friction property of titanium alloy substrate because

of the entrapment of wear particles in the dimples and dimple-induced graphitization

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