

Thursday Afternoon Poster Sessions, November 10, 2016

Tribology Focus Topic

Room Hall D - Session TR-ThP

Tribology Poster Session

TR-ThP1 Wear Behavior of Nitrided Cast Iron D6510 and Cast Steel S0050A under Normal Sliding and Inclined Sliding Conditions, *Chen Zhao, J. Zhang, X. Nie*, University of Windsor, Canada

Four different nitriding technologies, called plasma nitriding (A), fluidized bed nitriding (B), pulsed plasma diffusion process (C) and gas nitriding (D), were used for surface modification of cast iron D6510 and cast steel S0050A, respectively. Microhardness tester and EDX spectroscopy were used to measure the cross-sectional hardness and nitrogen concentration along the depth of the treated cast iron and steel samples. A pin-on-disk sliding test and inclined-sliding test were applied to evaluate the tribological properties of the treated samples under dry condition. Scanning electron microscopy and surface profilometry were also employed to study their wear behaviors. It was found that all cast iron samples had lower wear rates than cast steel samples during both the pin-on-disk sliding test and inclined-sliding test. While the cast iron samples behaved uniformly during these two different tests, the treated steel samples appeared to have a reversal trend in wear resistance. This phenomenon could be attributed to the formation of fatigue cracks on cast steel samples under ultra-high contact stresses during the inclined-sliding tests.

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Keywords: wear; nitriding; plasma nitriding; inclined sliding;

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