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## **The Improved Friction Properties of Bonded MoS<sub>2</sub> Films by MAO Treating of Al Substrates**

Hanjun Hu<sup>1</sup>, Hui Zhou<sup>1</sup>, Ruipeng Sang<sup>1</sup>, Yugang Zheng<sup>1</sup>

<sup>1</sup>Lanzhou Institute of Physics, Lanzhou, China

hhjhuj@163.com

The bonded MoS<sub>2</sub> films are widely used as solid lubricants in aerospace mechanisms due to their excellent tribological properties. Traditionally, the MoS<sub>2</sub> was directly bonded on the Al substrate that was only treated by the technique named sandblast. For improving the tribological properties of MoS<sub>2</sub> films, micro arc oxidation(MAO) instead of sandblast was introduced as a new technique for treatment of Al substrate. In this article, the tribological properties of MoS<sub>2</sub> films bonded on different surface of Al substrate as mentioned above were discussed, respectively. It is concluded from the test results that the MoS<sub>2</sub> films bonded on substrate treated by MAO have better tribological properties than the ones treated by sandblast, and the endurance life against abrasion of the former is as high as four times than the latter by the stand test method of ball on disk using the UMT Multi-Specimen Test System. This phenomena can be illustrated by the following reasons: One point is the porous microstructures of MAO ceramic coatings on the Al substrate. The coatings have numerous pits to be good at imcreasing the binding force with the MoS<sub>2</sub> films, and the pits can also provid a MoS<sub>2</sub> lubricants reservoir during processes of friction. Both of them improvedthe MoS<sub>2</sub> films' ability of wear-protective; Additionally, naturally the MAO coatings' hardness is higher than the Al□and this makes sure that the coatings of wearing resistance are better,especially in practical application to big load-supporting moving parts, such as gear, bearing, etc. .

### **Keywords**

MoS<sub>2</sub>

micro arc oxidation

tribological

wear

endurance life