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PII: S0257-8972(14)00479-4
DOI: doi: 10.1016/j.surfcoat.2014.05.052
Reference: SCT 19439

To appear in: *Surface & Coatings Technology*

Received date: 11 January 2014
Revised date: 26 May 2014
Accepted date: 29 May 2014

Please cite this article as: Jianmin Chen, Jie Yang, Xiaoqin Zhao, Yulong An, Guoliang Hou, Jie Chen, Huidi Zhou, Preparation and properties of Poly-(p)-oxybenzoyl/aluminum bronze composite coating by atmosphere plasma spraying, *Surface & Coatings Technology* (2014), doi: 10.1016/j.surfcoat.2014.05.052

Preparation and properties of Poly-(p)-oxybenzoyl/aluminum bronze composite coating by atmosphere plasma spraying

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Abstract

Poly-(p)-oxybenzoyl/aluminum bronze (denoted as POB/CuAl) composite coating was deposited as a candidate of lead-free bearing surface on steel substrate by plasma spraying. The composition, microstructure, and chemical feature of the sprayed POB/CuAl composite coating were analyzed by scanning electron microscopy, energy dispersive spectrometry, and Raman spectroscopy. And the friction and wear behavior of POB/CuAl composite coating was evaluated and compared with that of pure aluminum bronze coating and AISI-E52100 bearing steel on a ball-on-disc reciprocal tribometer. It was found that plasma sprayed POB/CuAl composite coating possesses low and stable friction coefficient in combination with greatly reduced wear rate as compared with pure CuAl coating and AISI-E52100 bearing steel. More importantly, the POB/CuAl composite coating causes minimum damage to its frictional counterpart, which is significant for its application as a lead-free bearing surface. This is

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