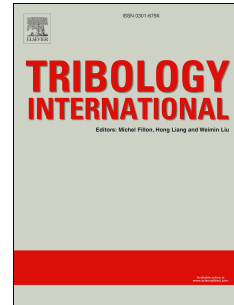


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Potential of different nickel coatings for optimizing the sliding behavior of electrical connectors

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Abstract

The potential of several nickel coatings was investigated by reciprocating sliding tests against copper thus simulating the plug-socket system of an electrical connector. Especially, the nanocrystalline nickel coating produced by electro-plating was prone to cold-welding after a short running-in period. The duration of running-in was affected by extremely thin surface films and surface roughness. Furthermore, tribooxidation was observed. Since mostly both mechanisms occurred simultaneously, the sliding behavior became unstable and hardly predictable. On the other hand, an electroless deposited Ni-P coating was neither prone to cold-welding nor to tribooxidation. Its coefficient of friction was low, well predictable and no signs of wear were observed.

Keywords: Electrical connectors; Electro-plated nickel coatings; Electroless Ni-P; Cold-welding; Tribooxidation

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