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**Tribological behaviours of PVD TiN and TiCN coatings in artificial seawater**

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**ABSTRACT**

To improve the tribological performance of sea frictional components, TiN and TiCN coatings, were used for surface protection of the components. The coatings were deposited on stainless steel and WC cemented carbides by arc ion plating. The coating topography was observed using scanning electron microscopy (SEM), the composition and structure were analyzed by energy dispersive spectroscopy (EDS) and X-ray diffraction (XRD). Hardness and adhesion force were tested by nanoindentation and scratch tester, respectively. The friction and wear properties of TiN and TiCN coatings were investigated by ball-on-disk tribometer in air, distilled water and artificial seawater. The results showed that both TiCN and TiN coatings had a strong (111) preferred orientation. The friction coefficients of coatings in distilled water and artificial seawater were lower than those in air. This indicates the influence of aqueous solutions on the friction coefficient due to the lubricative film formed on the coatings. However, the wear loss of coatings in artificial seawater was larger than those in air and distilled water, this demonstrates a positive synergism between corrosion and wear in artificial seawater. The TiCN coating shows the best wear resistance in the artificial seawater.

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