

## The properties of nanocomposite TiAlN coatings prepared by filtered arc ion plating process

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TiAlN coatings with various nanostructures were produced by filtered arc ion plating methods. The ratio of Ti:Al composition, the pressure and the flux of nitrogen were changed during the deposition. The effects of third elements such as Si, Cr, B on the formation of nanocomposite were also studied. The resulting microstructures were multilayered structure with the layer thickness less than 50 nm, intra/inter type and nano/nano type nanocomposites with the grain size less than 50 nm. The microhardness of nanocomposite coating was over 40 GPa. The thermal stability, oxidation resistance and mechanical properties were characterized in terms of their phase composition, nanostructure. The proper nanocomposite coatings with high hardness and high thermal stability were deposited on the tungsten carbide end mills and their cutting performance and tool life were also given in this study.