

Effect of Bias and Cr/N Ratio on the Mechanical and Tribological
Properties of Sputtered CrN Coating

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Abstract

Hard ceramic coatings such as TiN and CrN are very successful and widely used in improving the performance of cutting and forming tools. Some research showing CrN coatings can provide a lower friction and better corrosion resistance compared to TiN coatings [1]. The wear resistance of CrN coated tools is better than TiN coated tools in cutting Cu, Al, Ti and Ni alloys. The CVD CrN coatings enhance the service life of the mold over 300% in drawing of Al billets, and provide a better surface quality [2]. It was also reported that the performance of CrN coatings strongly depends on the sputtering parameters in coating process [3]. It is essential to clarify these problems and to obtain the optimized sputtering conditions. The aim of this study is to deposit chromium nitride (CrN) thin film by unbalanced reactive sputtering method and to investigate the effect of bias and Cr/N ratio on microstructure, mechanical and tribological properties of thin films.

Keyword : Tribological Properties

Sputtered