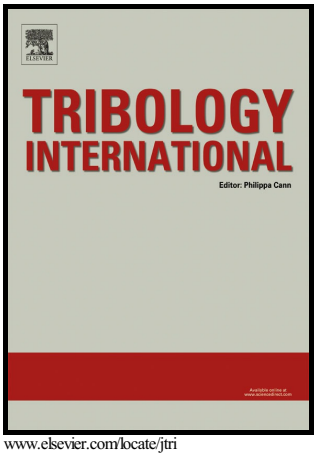

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Abstract

In this study, the wear mechanisms present on the surfaces of carbide tools coated with TiC/TiCN/TiN by CVD were investigated during the turning of two stainless steels: martensitic S41000 and supermartensitic S41426. Tool life tests were performed under several cutting conditions. The flank wear was monitored throughout the tests and at the end the wear mechanisms were investigated using a scanning electron microscope (SEM) equipped with EDS. The results showed that at high cutting speeds and high depth of cut the supermartensitic stainless steel presented a shorter tool life than the martensitic stainless steel. In the machining of martensitic stainless steel abrasion and diffusion were the prevailing wear mechanisms, while for the supermartensitic stainless steel attrition and abrasion were dominant.

Keywords: *Tool wear mechanisms; Martensitic stainless steels; Supermartensitic stainless steels; Tool life testing.*