



Cr₂N/CrN multilayer coatings for wood machining tools

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ARTICLE INFO

Article history:

Received 30 January 2011

Received in revised form

5 May 2011

Accepted 5 May 2011

Available online 11 May 2011

Keywords:

Wear resistant coating

Wear

Machining

Surface roughness

ABSTRACT

The present paper describes results from a recent research project aimed at forming a wear resistant coating based on chromium on tools to wood machining. Cr₂N/CrN multilayer coatings deposited on H56-5-2 steel substrates using cathodic arc evaporation were tested. These coatings were formed from 7 bilayers being ca. 340 nm thick and equally thick Cr₂N and CrN layers. For comparison, Cr₂N and CrN monolayer coatings were also prepared. Hardness measurements, indentation and scratch tests, friction and wear were performed to characterize the mechanical properties. The wear tracks and Rockwell indentations enable to assess wear mechanisms of the coatings. The results of the Cr₂N/CrN coatings investigated show high hardness: ca. about 22 GPa and a critical force being higher than 95 N and a low wear rate.

The industrial tests of planer knives with Cr₂N/CrN multilayer coatings were carried out on a down-spindle milling machine to determine the durability of tools with wear resistant coatings for woodworking. These tools show increase of "life time" two times. Another positive feature of the use of such tools is the increase of the quality of wood surface machined when compared with uncoated tools.

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