G2 微粒子ピーニングの工具・難加工性材料加工への応用

Application of micro shot peening process to improve tool life of cutting edge

Member

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Joint company

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Program

Surface modification of cutting edge using micro shot peening process

Objective

Synergistic effects of surface texture consisted from micro dimples and work hardening resulted in developed micro shot peening system on improvement of tool life of cutting edge

Procedure

Micro shot peening process was applied to cemented carbide cutting edge using a developed system possible to peen with ultra-fine particle less than 10 μm at controlled flow rate was applied. Detailed schematic and overview of the peening system was shown in Figs. 1 and 2.

Results

Micro sized texture resulted in plastic deformation consisted from micro dimples was formed on the WC-Co based cemented carbide tool edge (Fig. 3). It was found that the fracture toughness of the tool tip increased and that the frank wear rate on the contentious turning process with stainless steel decreased.

Application

Cutting edge treatment for die materials such as quenched steel.

Fig.1 Overview of developed peening system

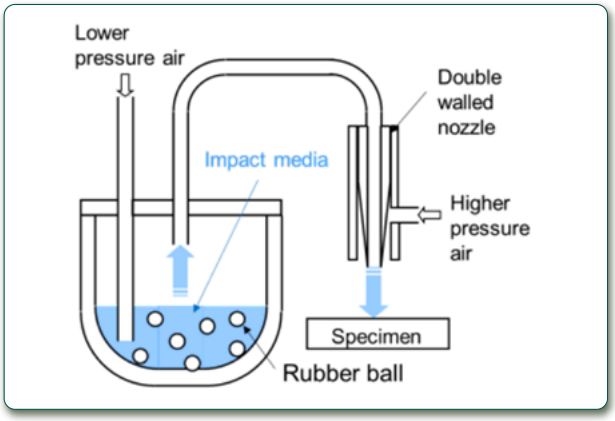

Fig.2 Schematic of peening system

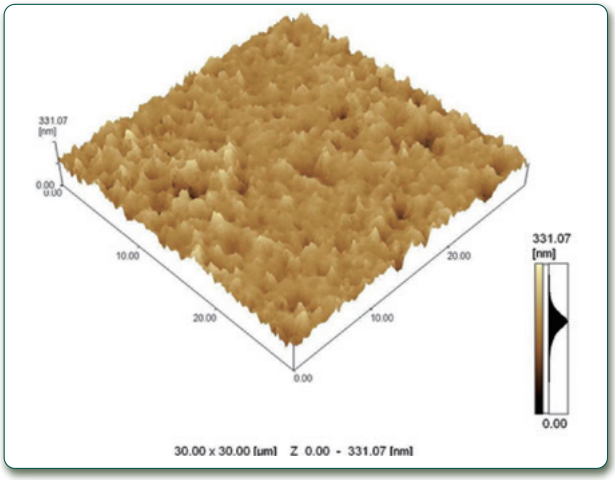

Fig.3 AFM image of micro shot peened cemented carbide surface