

Cutting Performance of BDD Coating on WC-Co Tools

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Abstract : Chemical vapor deposition (CVD) diamond coated cutting tool has excellent cutting performance, it is the most ideal tool for the processing of nonferrous metals and alloys, composites, nonmetallic materials and other difficult-to-machine materials efficiently and accurately. Depositing CVD diamond coating on the cemented carbide with high cobalt content can improve its toughness and strength, therefore, it is very important to research on the preparation technology and cutting properties of CVD diamond coated cemented carbide cutting tool with high cobalt content. The preparation technology of boron-doped diamond (BDD) coating has been studied and the coated drills were prepared. BDD coating were deposited on the drills by using the optimized parameters and the SEM results show that there are no cracks or collapses in the coating. Cutting tests with the prepared drills against the silumin and aluminum base printed circuit board (PCB) have been studied. The results show that the wear amount of the coated drill is small and the machined surface has a better precision. The coating does not come off during the test, which shows good adhesion and cutting performance of the drill.

Keywords : cemented carbide with high cobalt content, CVD boron-doped diamond, cutting test, drill

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