

Ablation study of PCD composites using 12 picosecond and 400 femtosecond pulse durations at infrared wavelengths

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Abstract: Polycrystalline diamond (PCD) has become an indispensable tool material for efficient machining of various materials. Using two kinds of ultrafast lasers with different pulse width lasers at infrared wavelengths, the effects of laser power, frequency, scanning speed, filling linewidth and processing times on PCD were tried. After laser processing the material, each processing area were measured by three dimensional video microscopy, scanning electron microscope, Raman microscopy, x-ray diffraction and energy dispersive X-ray fluorescence spectroscopy. The ablation behaviour and surface roughness between the different laser parameters and the materials processed are analyzed, the element distribution and material changes before and after machining are compared and the graphitization of diamond is discussed.

Key words: ultrafast laser; superhard materials; micro/nano manufacturing

参考文献

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