



超硬合金研削加工時における加工状態の評価結果に関する検討

A Study of Results of Machining Condition Evaluation During a Cemented Carbide Grinding Process

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Cemented carbide, a metal made from sintered metal carbide powder, is used mainly in forging dies. To meet customers' needs, which are becoming more stringent year by year, these dies must be machined with high precision. In this study, we evaluated machining quality from various data obtained during the cemented carbide grinding process, hoping that this might help us to reduce costs by performing high-precision machining without rework. We therefore undertook a study of methods of evaluating machining conditions. We tried evaluating machining quality by evaluating roundness, integrated machining power consumption, and machined weight. The SN ratio results obtained from roundness evaluation and power evaluation lacked reproducibility, and the precise additivity of their effects could not be confirmed. We did, however, find general agreement and consistency in the sensitivity of power evaluation. We also found that by comparing simultaneously measured vibration data and power data, it might be possible to follow the machining status in real time, while the process was being monitored.

Key words : machining conditions, cemented carbide, grinding process, electric power, Taguchi methods, robust quality engineering, S/N ratio

1. はじめに

1.1 研究の背景

超硬合金は金属炭化物の粉末を焼結した金属であ

り、高い硬度を有している。また、高温になってもその硬度が低下しにくいという性質から、切削工具や金型部品で多く用いられている。超硬合金の加工法には、切削加工、研削加工、放電加工が主に用いられており、生産量や精度、用途によって使い分けられている。しかしながら、難加工材であるにも関わらず鍛造用金型用超硬合金に要求される加工精度は、形状精度で数 μ m のオーダーであり、かつ顧

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