事例研究

中ぐり加工のT法による診断および評価の研究

Diagnosis and Evaluation of Boring by T Methods

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This study is an application of the Mahalanobis-Taguchi system to boring diagnostic and evaluation. When applied to boring, Taguchi methods can predict the precision of finished products, diagnose problems, and predict cutting precision from electricity data. This study deals with finished product prediction and diagnosis of problems. To predict the precision of finished products, an analysis was performed with data obtained from a waveform analysis of electricity data from the first processing as a data item and the S/N ratio obtained through parameter design as a signal. As a result, a prediction system was obtained with a precision level of 5 to 6 db, depending on the way in which the unit space was determined. For diagnosis of problems, the possibility of diagnosis by the Recognition-Taguchi system was examined with damage to the cutting blade during the experiment as the problem, and 30 items of electricity data obtained by 3-second waveform analysis as the data item. It was shown that problem diagnosis is possible by setting a separate unit space and threshold value for each processing state.

Key words : Taguchi methods, S/N ratio, periodic analysis, MT system, evaluation by the electricity, boring, processing with the lathe, cutting

1. 研究の背景と目的

前報「電力評価を用いた中ぐり加工の最適化に関する研究」[1] において，中ぐり加工に対する品質工学の適用を行い，切削量-電力，時間-電力評価を用いた最適化を行った。評価法として，総合的な加工状況の評価である電力評価を用い，それと共に，中ぐり加工の特殊性を利用し切削重量を直接測定した。切削重量を直接測定することによって，信号に切込みなどの擬似的な切削量ではなく，実際の仕事量を用いることが可能となった。そして，これらを利用した切削の評価を行うことにより，ある程度の再現性が得られたことから，電力による切削状態評

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