

Integrating MRSN Ratio and ANP to Optimize Process Parameter of Multiple-response Injection Molding Process

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Abstract

Multi-Response Signal to Noise Ratio (MRSN Ratio) technique is one of reformed Taguchi kind technique for using in multiple-quality response process parameter optimization. However, the assignment of each quality response weight in MRSN Ratio technique is a subjective or empirical process that may be unrealistic and possibly cause the misleading result of multiple-quality response process parameter optimization. Analytic Network Process (ANP) is a systemic process that applies ratio scales to evaluate internal relationship of dimensions, criteria, and alternatives. ANP method is popularly applied in setting criteria weight no matter in research or practice field. This research integrates MRSN Ratio and ANP to optimize process parameter of multiple-response injection molding process. The proposed approach overcomes the unrealistic problem of subjective weight setting in MRSN Ratio technique. Plastic injection molding process of modem bottom cover is used as a case study for comparing the performance between proposed approach and original MRSN Ratio technique. The comparison results show that proposed approach has better responses' performance than original MRSN Ratio technique.

Keyword : Multi-Response Signal to Noise Ratio;Analytic Network Process;Multiple-response Injection Molding Process;Process Parameter