Testing the capability of fuzzy processes[*]

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Abstract

Fuzzy process capability indices are used to determine whether a production process is capable of producing items within fuzzy specification tolerance. In this paper we test a fuzzy process capability index $\tilde{C}_p$, where instead of precise quality we have two membership functions for specification limits. Numerical examples are given to show the performance of the method.

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1 Introduction and preliminaries

A process capability index (PCI) is a real number as a summary that compares the behavior of a product or process characteristic with engineering specifications. A process is said to be capable if with high probability the real valued quality characteristic of the produced items lies between the lower and upper specification limits (SLs). There are several PCIs such as C_p, C_{pk}, C_{pm}, which are used to estimate the capability of a manufacturing process [10, 11].