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Measuring the manufacturing process yield based on fuzzy data

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Abstract

The process yield is the most basic and common criterion used in the manufacturing industry as the basis for measuring process performance. In the conventional case, the underlying data for a manufacturing process are obtained from the output responses of continuous quantities that are always assumed to be real numbers. However, measurement of the output process occasionally appears to be imprecise in practical situations. Accordingly, the output responses should be assumed to be so-called fuzzy data. We propose a constructive methodology to obtain the fuzzy estimate of the yield index S_{pk} with the help of the extension principle of fuzzy sets theory. This study, based on an analytical approach, is an advancement over existing technology in the area of process capability analysis that is easy to implement in plant applications.

Keywords:

quality engineering | process capability | fuzzy data analysis | process control

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