Quality control and process capability assessment for injection-moulded micro mechanical parts

Quality control of micro components is an increasing challenge. Smaller mechanical parts are characterized by smaller tolerance to be verified. This paper focuses on the dimensional verification of micro injection-moulded components selected from an industrial application. These parts are measured using an optical coordinate measuring machine, which guarantees fast surface scans suitable for inline quality control. The uncertainty assessment of the measurements is calculated and three analyses are carried out and discussed in order to investigate the influence parameters in optical coordinate metrology. The estimation of the total variability of the optical measurements and the instrument repeatability are reported; moreover, the measurement system capability is evaluated according to the measurement system capability indices $C_g$ and $C_{gk}$.

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