

## Comparison of measurements from optical CMM and focus-variation microscope of a $\mu$ PIM mechanical part - DTU Orbit (09/11/2017)

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Two sets of 5 green and 5 sintered mechanical parts, manufactured by micro powder injection moulding ( $\mu$ PIM), were measured using an optical coordinate measuring machine (OCMM) and a focus-variation microscope (FVM). The examined features of size, including diameter, radii and distances, span in the range of (10-1-101)  $\mu$ m. Comparing the corresponding measurements from the two instruments, a relative maximum deviation of 8 % was found for the linear dimensions of the green parts and a relative maximum deviation of 6 % for the ones of the sintered parts. The maximum relative deviation of the radii was 17 % for the green parts and 30 % for the sintered parts (relative deviations have been evaluated considering focus-variation measurements as reference). OCMM showed some problems in the detection of the smallest dimensional features (above all radii) where the presence of defects on the edges, quite typical for parts produced by  $\mu$ PIM, was particular critical for the measurements. The extraction of results obtained from FVM was less critical because performed with a dedicated post-processing software which allowed to better define the measured dimensions. Furthermore, the chance to measure other geometrical features, such as surface texture and flatness, may depict FVM measurements as more attractive. However, measurements should be suitable for in-line quality control, in a production environment, where fast cycle time is required and measuring times are more compatible to those of the OCMM.

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