Statistical quality assessment of 3D Printed products

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Abstract

The present research considered the effects of different 3D printing parameters on quality of 3D printed products. The parameters included nozzle size, printing direction and product materials. The quality assessment measures included surface finish and dimensional. Products were printed using the FDM technology. A full factorial set of experiments were conducted. For each experiment, dimensions and surface roughness measurement were taken at different locations of the products. Experimental results showed that the product quality is comparable to IT12 to IT16 manufacturing processes. Statistical analysis of results showed that the different printing parameters affects significantly the quality assessment measures. For relatively large dimensions, the material and nozzle size do not have a significant effect on dimensional accuracy.