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Abrasive jet deburring of jewellery models built by stereolithography apparatus (SLA)

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Abstract

This paper outlines the results of an investigation into the effect of abrasive jet deburring processes on the surface finishing of jewellery models built by stereolithography apparatus (SLA). The inherent layering process of the SLA results in visible steps on the surface of the model. The investigation aims to determine the significant parameters of the deburring process, to determine a practicable range of settings of these parameters for effective deburring, and to establish the optimum settings. The parameters identified for study are screened down to the abrasive media, the nozzle distance, the air pressure and the blasting time. The results show that the blasting time is a highly significant parameter, whilst the blasting distance is not. The effect of the air pressure varies with the size of the features of the model. The effectiveness of the deburring process is also dependent on the orientation of the visible steps. In the development of an experiment strategy, statistical techniques, including

factorial experiments, optimum search and *F*-Test analyses, were performed. The results, in terms of dimensions, weight and surface roughness taken before and after the specimens were subjected to deburring are compared and discussed.



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Keywords

Rapid prototyping; Abrasive jet deburring; Jewellery; Surface finish; Stereolithography apparatus; Computer-aided design and manufacturing

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