ENHANCING THE SURFACE ROUGHNESS OF FUSED DEPOSITION MODELING PRODUCTS

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Abstract:

Fused deposition modeling (FDM) is the most versatile additive manufacturing technology owing to the low-cost materials that handle. However, FDM produce very rough parts which limit its use in molds and other industrial applications owing to stair-case effect. To obtain smoother surfaces, a post-processing phase may be introduced. In this research, a non-contact finishing process to FDM parts using hot air was developed. The hot air is directed locally at the stair-case in the surface till melting it which results after cooling to a smoother surface. An experimental setup was constructed to study the effects of different process parameters including air temperature, air flow rate and the moving velocity of air nozzle over parts surface. An improvement in the Roughness Average of a surfaces measured microscopic peaks and valleys (Ra) down to values of sub-micron was recorded from specimens with average surface roughness from 7 to 8 μm.

Keywords:

fused deposition modeling -surface roughness- non-contact machining

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