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Analysis of the Adjusting Bolts System's Contribution to Levelling Error of the Heated Bed in FDM 3D Printer
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Abstract

The 3D printer as one of the key technologies in the industrial revolution 4.0 has developed rapidly to improve manufacturing efficiency. Various printing machines and methods have been invented and the Fused Deposition Modelling (FDM) 3D printer is one of them. It works by depositing melted polymer materials layer by layer to form a product. Difficulties in setting up the level of the heated bed are one of the difficulties faced by the users. Tiny bolts that are used as the levelness adjuster of the heated bed's platform contribute to the error of the levelness setup. This research analyzes how difficult is the leveling setup process and how the adjusting bolt might involve in leveling error of the heated bed. This research examines three leveling methods to adjust the levelness of a heated bed. Each method was performed three times then the results were checked using the Coordinate Measurement Machine (CMM). The experiment shows all leveling methods obtained a levelness deviation that is higher than the maximum allowance. The mathematical equation also explained that the adjusting bolts system may cause levelness difficulties. © 2023, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author Keywords

FDM 3D printer; Heated bed; Rapid prototyping; Surface levelness

Index Keywords

Coordinate measuring machines, Errors, Fused Deposition Modeling, Printing presses; Fused deposition modeling 3d printer, Heated bed, Industrial revolutions, Key technologies, Levelings, Manufacturing efficiency, Printing machines, Printing method, Rapid-prototyping, Surface levelness; Bolts

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