

ACCURACY OF POLYMER ELECTROLYTE MEMBRANE (PEM) FUEL CELL REFORMER PROTOTYPES USING FDM AND SLA 3D PRINTING TECHNOLOGY IN COMPARISON WITH DIGITAL CAD MODEL

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Abstract

The subject of this paper is the evaluation of accuracy of FDM and SLA 3D printing technologies, in comparison with developed reformer polymer electrolyte membrane (PEM) fuel cell CAD model. 3D printing technologies allow bottom-up approach to manufacturing, depositing material in layers to final shape. Dimensional inaccuracy is still a problem in 3D printing technologies due to material shrinking and residual stress. Materials used in this research are PLA (Polylactic Acid) for FDM technology and standard white resin material for SLA technology. Both materials are commonly used for 3D printing and have good dimensional stability. PLA material is printed in three different resolutions: 0.3mm, 0.2mm and 0.1mm. White resin is printed in 0.1mm resolution. The aim of this paper is to show how different printing resolutions affect dimensional accuracy of FDM models and to compare dimensional accuracy of FDM and SLA printing technologies.

Keywords

Reformer, 3D printing, FDM, SLA, CAD model

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