

## Accuracy of a 3D-Printed Polymer Model for Producing Casting Mold

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**Abstract :** The work's purpose was to evaluate the possibility of manufacturing casting tools utilizing Fused Filament Fabrication, a 3D printing technique, without any post-processing on the printed part. Taguchi Orthogonal array was used to evaluate the influence of extrusion temperature, bed temperature, layer height, and infill on the dimensional accuracy of a 3D-Printed Polymer Model. A Zeiss T-SCAN CS 3D Scanner was used for dimensional evaluation of the printed parts within the limit of  $\pm 0,2$  mm. The mold capabilities were tested with the printed model to check how it would interact with the green sand. With little adjustments in the 3D model, it was possible to produce rapid tools without the need for post-processing for iron casting. The results are important for reducing time and cost in the development of such tools.

**Keywords :** additive manufacturing, Taguchi method, rapid tooling, fused filament fabrication, casting mold

**Conference Title :** ICPIPV 2023 : International Conference on 3D Printing, Image Processing and Visualization

**Conference Location :** Paris, France

**Conference Dates :** March 27-28, 2023