

# Implementation of a New Dimensional Qualification (DQ) Method for an Open Access Fused Deposition Modeling 3D Printer

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## Abstract

The present work implements for the first time a dimensional qualification procedure of rapid prototyping process in the case of 3D Open Access printer. Thus, to improve this, the author proposes a developed methodology and specific procedure with an implemented test pieces measurement. The experimental results are compared in accordance with the designer specifications which resulted in a methodological qualification procedure developed in the research laboratory. In addition, this procedure provides an accurate information about the manufacturing process quality for a 3D printing's Fused Deposition Modelling (FDM); taking into account the upstream and downstream of the deposition material. This paper presents a comparative evaluation between the design data and measurements realized on a production model. The obtained result serves to confirm the quality of the machine according to the manufacturer's specifications and allows its qualification. Once the dimensional qualification (first stage) is achieved, it could be considered as a prelude to a geometric qualification (second stage). Then, a complete validation is done on a machine randomly taken from a series of commercial printers. This methodology has shown its efficiency with current 'Open Access' 3D printers and could be used as quality labelling tool.

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## Keywords

Qualification; 3D; Piece Test; Quality Insurance; Rapid Prototyping

## Full Text:



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