A Comparative Performance Analysis of FDM Machines Based on a Calibration Artefact

During the past ten years Additive Manufacturing (AM) technologies have been constantly developing in terms of materials and processes. This allows the use of the AM not only during the preproduction but also for the manufacturing of final components for commercial use [1], [2]. However one of the still existing challenges for AM concerns the quality of the final components. Every manufacturing process has a strict set of requirements that every component has to meet in order to meet production tolerances, yet AM still shows a lack of industrial standards [3]. The advantage of AM to be able to manufacture components of very complex geometries with intricate internal features becomes in this case a drawback. In fact, the control of the quality and the verification of tolerances become difficult task to accomplish with traditional measuring equipment. Some features can be difficult to reach and there are no standards to compare them with. To overcome this problem, a method to evaluate the performance of AM machine tools based on the printing of an artefact and the subsequent measuring of its features is proposed and shown. This paper shows a validation of the method by means of a laser interferometer. Furthermore, different AM machines are tested using the printed artefact.

General information
State: Published
Organisations: Department of Mechanical Engineering, Manufacturing Engineering, Department of Applied Mathematics and Computer Science
Contributors: D'Angelo, G., Nielsen, J. S., Rasmussen, J., Pedersen, D. B.
Number of pages: 5
Publication date: 2014

Host publication information
Title of host publication: Proceedings of the 29th Annual Meeting of the American Society for Precision Engineering
Source: PublicationPreSubmission
Source-ID: 105849030
Research output: Research - peer-review Article in proceedings – Annual report year: 2015