REVIEW OF MASTER'S THESIS - SUPERVISOR'S COMMENTS

Author of the master thesis: Rakeshkumar D. Soni

Name of the master thesis: Dimensional stability of parts manufactured by additive technologies

Supervisor of the master thesis: Ing. Radomír Mendřický, Ph.D.

The aim of thesis was to analyse the long-term geometric stability of parts produced by additive technologies (using 3D printing). For the assessment of the dimensional and shape accuracy of produced models was used contactless measurement methods.

The introductory theoretical part, the author describes the process of additive manufacturing of parts and various 3D printing technology (FDM, PolyJet, SLS, SLA) used in the thesis for production of models. Non-contact measurement procedures and the climatic tests to which the parts were exposed are described. The theoretical part of the thesis is appropriately chosen with respect to the topic and I have no more serious comments.

In the practical part of the thesis, the student deals with scanning samples using the ATOS II 400 contactless scanner and data evaluation in SW GOM Inspect Professional V8. The digitized data was compared with both the nominal CAD model and with the scanned data that was taken immediately after the samples were printed. In this way, a detailed inspection of the models was done 3 months after printing, one year and one year and test 1 (cycle test of humidity and temperature) and test 2 (exposure to UV radiation) after printing. The results were analysed with respect to aging over time, with respect to the material used and the printing technology. The effects of test 1 and 2 were monitored too. It is evident from the practical part that the student broke into the problematic and he can apply theoretical knowledge practically.

The diploma thesis is elaborated clearly in an overall view, it has a logical succession, and formal aspect of the work is good. The author worked independently and actively throughout the thesis. The diploma thesis is processed very carefully. The results of the analyses are evaluated without mistakes. Conclusions are very valuable for practice, as 3D printing is increasingly used not only for prototype parts production, so it is necessary to know the behaviour of the material over time.

Evaluation aspects of master's thesis	Assessment *
Fulfilling scope of assignment	1
Quality of the abstract, keywords ...	1
Scope and quality of the search	2
Correctness and completeness of references	1-
Suitability, proportionality of the methodology used	1-
Professional level of work, results processing, discussion	1
Initiative to solve problem	1
Own contribution to solved problems	2
Formulation of the conclusions of the thesis	1
Importance for practice, applicability	1
Typographic and language level	1-
Formal aspects and structure of thesis (text, chapters, illustrations)	1

* 1 Excellent, 1- Excellent minus, 2 Very goog, 2- Very goog minus, 3 Goog, 4 Failed.

Additional questions:

1) What type of alignment (nominal versus current model) did you use during the inspection? Does the type of alignment the effect on the evaluated dimensions and the colour map of deviations? If so, explain how and why.

Classification of work:

This work meets the requirements of the assignment and for the conferment of academic degree, therefore I recommend it for the defence.

I suggest this work to classify as   1 ... Excellent

Liberec, 2018/05/31

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Ing. Radomír Mendřický, Ph.D.
Master's thesis supervisor