

Diploma thesis

Candidate name: **Jitendra Reddy Kondapally**

Diploma thesis topic: **Fatigue properties of H13 tool steel processed with use of Selective Laser Melting technology**

General evaluation

The thesis is dealing with very actual topic of additive manufacturing. Topic is actually of the main focus of materials scientists from whole world. As it is rather new field with huge application potential there is invested a lot of attention and money into research in this field.

Theoretical part evaluation

Theoretical chapters 2-4 provide suitable insight into the field of investigations. Provided information in text or in graphical form are appropriate creating sound background for subsequent experimental part. The extent of this part is in line with its content.

Experimental part evaluation

The experimental part (chapters 5-8) describes test pieces preparation and applied analyses and tests. Specimens' preparation is described in sufficient detail in satisfactory manner. Basic characterisation is provided in terms of metallography, fractography and hardness measurements. These supporting information are appropriately worked out and presented. Description of tensile test was done appropriately, however performing just one test especially in the case of brittle material as in the current case is rather underestimation of the characterization reliability. Low cycle fatigue tests were carried out only just for one set of specimens. Discussion of results especially in the means of data confrontation at least with previous results is rather poor.

Diploma thesis

Overall diploma thesis assessment

The diploma work comprises of two parts consisting of 8 chapter altogether with appropriate amount of text pages. The work is written in comprehensible way with clear introduction part containing also lists of used abbreviation, pictures tables and used symbols. This makes reading of work very easy. Presented pictures are of high quality which also contributes to the work high formal quality. The language used is very clear and text contains minimum of formal errors such as repeating words, omitted reference to figure, or swapped upper and lower case of letters in units. These are minor errors without impact on overall work quality. The number of references used in the work is 19 which is not very extensive, especially in this very actual topic where lot of publications are being published in these days. The biography at the end of the work gives hint these might be authors publication, so maybe better would be to use work **references** in order to avoid some misleading conclusions.

The thesis provides original results contributing to global knowledge of the resolved problematics.

I have following remarks concerning the work presented:

- More tensile tests have to be performed.
- More low cycle fatigue data sets have to be tested in order to draw out some sound conclusions.
- Better discussion of obtained results regarding to data published would be beneficial.

Questions:

- Why only vertical build direction was considered?
- What properties can be expected if horizontal build direction would be used in relation to the results obtained?

Conclusions

The diploma work presented fulfils pre-defined tasks and covers all requirements for academic title award of Engineering degree.

I recommend the diploma thesis for defence.



Place and date: Dobřany 9.6.2017

doc. Ing. Ján Džugan, Ph.D.

Signature

Diploma thesis

Diploma thesis grading proposal

Author

Jitendra Reddy Kondapally

Grading

(excellent/very good/**good**/fail)

A handwritten signature in blue ink, appearing to read 'Džugan', with a long horizontal flourish extending to the right.

In Pilsen: 9.6.2017

doc. Ing Ján Džugan, Ph.D.

signature