

EVALUATION OF BACHELOR THESIS

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This bachelor thesis focuses on the effect of the Shape Memory Alloy powder particles' morphology on the final quality and microstructure of the Radio Frequency Inductively-coupled Plasma (RF-ICP) deposited coatings. By conducting a detailed microstructural analysis of the initial powder and deposited coatings, the chemical and phase composition of the Ni-Ti coating are investigated.

The thesis is well prepared. The first part reviews the principles of two main cores of the thesis, namely, shape memory alloys and thermal spray technology with a focus on Ni-Ti shape memory alloy and RF-ICP thermal spray process. The fundamentals, different types and applications, and a scientific background of each of these subjects are well-explained. This part gives a very well explanation of the process, and a good link between the subjects is demonstrated.

The second part of the thesis focuses on the experimental procedure and the results of the project. The results are meaningful, and the following discussions are well written. The results show a significant dependency of the final coatings microstructure on the initial parameters of the powder particles. Furthermore, the results shows that RF-ICP is a promising thermal spray technique for depositing shape memory alloy, in this case NiTi coatings, without the introduction of oxide contents during the process. The change in the phase composition was reported to be insignificant.

Below you can see few minor comments and questions:

- **Comment 1:** (page 1, paragraph 2) I suggest adding “almost” (or any word of your choice) to the sentence to keep the consistency of the thesis since the feed rate of RF1 and RF2 was not identical (according to page 13 Table 1: RF-ICP deposition parameters). You have also mentioned this in your results and discussion (page 25 last paragraph)

Suggestion: “Both were deposited using **almost** the same RF-ICP parameters ...”

- **Question 1:** (on general knowledge) Can be shape memory alloys deposited by a high velocity thermal spray techniques (for example cold spray of HVOF)? (Considering a high plastic deformation of the initial particles upon impact)
 - **Question 2:** (on technical knowledge) Which one of your scenarios (RF1 or RF2) will you suggest for further investigation and research? Why?
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Overall, I rate the thesis with **grade A** and recommend it **to be accepted for oral defense**.

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