

Master Thesis / Semester Thesis

Development of processing parameters to built a functional graded material steel to Ni-based alloy

Motivation

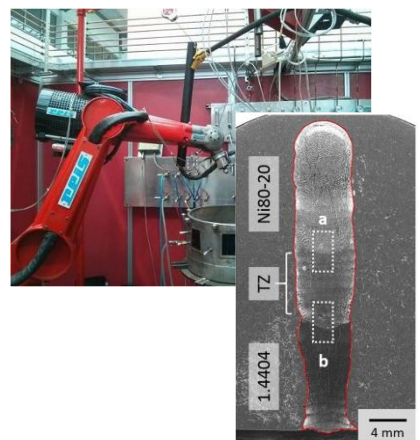
Functionally graded materials (FGMs) offer a unique approach to seamlessly transition between different materials, combining the desirable properties of both. In additive manufacturing, the challenge lies in developing optimal processing parameters to achieve a controlled gradient while maintaining structural integrity and performance. Steel-Ni-based alloy FGMs have significant potential in high-temperature and wear-resistant applications, such as aerospace and energy sectors, where tailored material properties can enhance performance and longevity.

Objective

This thesis aims to develop and optimize the processing parameters for fabricating a functionally graded material (FGM) transitioning from steel to a Ni-based alloy using additive manufacturing. The research will focus on understanding the influence of process parameters on microstructure evolution, mechanical properties, and gradient control to ensure a defect-free, high-performance material.

Tasks

- Literature review.
- Process design and experimental setup
- Experimental fabrication and characterization
- Report writing and documentation



Your profile

- Prior experience with additive manufacturing is desirable.
- Familiarity Design of Experiments (DOE) is an advantage.
- Ability to work independently and conscientiously.
- Good proficiency in English (written and spoken).

Contact

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