

Master Thesis - “Effect of carrier gas flow on porosity and bead characteristics” (30 credits/20 weeks – 1 student)

About us

GKN Aerospace is the world’s leading multi-technology tier 1 aerospace supplier. With 55 manufacturing locations in 15 countries, we serve over 90% of the world’s aircraft and engine manufacturers. We design and manufacture innovative smart aerospace systems and components. Our technologies are used in aircraft ranging from the most used civil aircraft to the world’s advanced 5th generation fighter aircraft and the Ariane orbital rockets used by ESA.

Project Background

At GKN Aerospace in Trollhättan there is a large focus on Directed Energy Deposition (DED) to both improve products but also come up with new ground breaking use-cases. DED is one of many Additive Manufacturing (AM) methods that is showing promising results to both reduce waste material but also enable designs of more organic products. To be able to introduce DED on flying components it is important to have control of the deposition process and make sure that the deposited material meets the tight requirements in the industry.

This master thesis will therefore be focused on AM using DED using powder as feedstock and the equipment that is necessary for this process. For DED-powder to function properly a great deal of parameters and equipment needs to be understood and be fine-tuned with each other to produce a result that fit these tight requirements.

Therefore, this master thesis project will focus on studying and mapping the effect of carrier gas and shielding gas have on the porosity and, bead characteristics such as width, height and penetration depth.

Assignment Description

- Literature review focused on L-DED-P.
- Understand the process, its equipment and the effect all different components have on the final result
- Design and evaluate DoE to investigate effect of carrier gas and shielding gas on bead characteristics
- Use of different sensors to characterize nozzles in the workshop
- Evaluate and optimize equipment for control of gas flow rates in the process

The thesis work will be supported by appropriate process and materials engineers.

Qualifications

- Student in final year of M.Sc. studies in mechanical-, material-, automation engineering or similar
- Interest in programming and material science
- Previous experience of material characterization using laboratory equipment is recommended
- Workshop experience is recommended
- Basic knowledge of Additive Manufacturing recommended
- The student should be capable of taking initiatives on their own
- GKN would prefer if the student can perform most of the work on site at the Global Technology Centre organization in Trollhättan, Sweden



Apply by

Send your resume and cover letter to:

Andreas Segerstark, andreas.segerstark@gknaerospace.com

David Lindell, david.lindell@gknaerospace.com

Interviews will be held continuously