

Master Thesis - “Simulation of creep deformation in aero engine additive manufactured components” (30 credits/20 weeks – 1 or 2 students)

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

Creep is a phenomenon where the material deforms plastically during a constant stress at higher temperatures. For aero engine components operating at high temperatures it is important to control the design so that creep deformation does not cause problems such as e.g. leakages at flanges. Often this is accounted for by simple models and legacy knowledge. However, when the product portfolio is expanded a deeper understanding and improved simulation skills for creep deformation are required. This is especially true for additive manufactured parts where there is a risk of also introducing anisotropic plastic and creep behavior.

Assignment Description

The work of this thesis will focus on:

- Literature study into creep phenomenon and creep simulation with emphasis on models available in Ansys
- Calibration of model parameters using available creep deformation material tests
- FE simulation of creep deformation for an additive manufactured component
- Sensitivity study of the creep deformation with respect to test data, material model and load data

Qualifications

Student(s) in the final year of their M.Sc. studies in the field Mechanical or Aerospace engineering with an interest in solid mechanics. Previous experience of FE analysis (e.g. in Ansys) and programming (e.g. in python) is recommended.

Apply by

Send your resume and cover letter to Björn Henriksson, bjorn.henriksson@gknaerospace.com

Last date for application: 2022-12-31. Interviews will be held continuously and the position could be filled prior to the last application date.

