
The ThermoPlastic composites Research Center (www.tprc.nl) is an open research center for fiber reinforced thermoplastic composites. TPRC performs research in co-operation with national and international partners, such as Fokker, TenCate and Boeing, on the processing and performance of thermoplastic composites. TPRC would like to reinforce its research team with an intern or graduation student on the topic of:

# INDUCTION WELDING OF THERMOPLASTIC COMPOSITE COMPONENTS

**Project description**

Thermoplastic composite (TPC) parts are increasingly used in the aerospace industry because of their superior stiffness to weight ratio and rapid manufacturability. A highly automatable method to assemble these manufactured parts is done by the induction welding (IW) technique. This technique is based on induction of eddy currents in the separate composite parts. These eddy currents generate sufficient heat to melt the thermoplastic matrix material after which a controlled cooling and properly applied pressure the two TPC components will be joined.

An essential tool to obtain full control of this joining technique is the capability to accurately predict – based on IW parameters - the temperatures at the weld interface on beforehand. This model needs to be validated by means of data obtained from actual experiments.

The aim of this assignment is to generate accurate experimental data obtained from induction heating experiments using the induction heating set-up, available at TPRC. The results of this research will contribute to the optimization of production processes at the industrial partners of the TPRC.

**Tasks**

This assignment focusses on obtaining reliable test data from induction heating experiments.

The work includes:

- Investigate relevant induction heating parameters on the thermal response of a heated object, which includes laminate production of thermoplastic composite laminates at the TPRC
- Creating a robust and reliable test set-up of an induction heating experiment
- Creating a robust and reliable data acquisition system for the induction heating experiment
- Discussion of the results in a written scientific report

**Practical information**

The project is to be performed within a time frame of 7-9 months. You will have a desk at TPRC and receive a monthly trainee remuneration of 250 Euro. Please contact Sebastiaan Wijskamp (sebastiaan.wijskamp@tprc.nl or 088-8773804) for additional information.