Continuous Ultrasonic Welding

Automated Joining of Thermoplastic Composites

SAM XL is a manufacturing expertise centre with a focus on automated low-volume manufacturing parts of high complexity. SAM XL researches and demonstrates new technologies, techniques, and materials for aerospace applications using robotics, lightweight composites and specialised manufacturing techniques.

Continuous Ultrasonic Welding (CUW) is a new thermoplastic composite welding process which uses ultrasonic vibrations to generate heat to melt the interface between two laminates, welding them together. CUW is of interest to SAM XL for its ability to strongly join parts together with minimal added weight. CUW is an experimental process that is still being developed, it is sometimes uncertain whether enough energy is being input to fully melt the interface. Work is underway to improve weld quality and reliability.

SAM XL is offering the following positions:

- 4-5 month internship, exploring approaches to ensure fully welded start and stop areas for continuous ultrasonic welding. Including study into effect of re-welding part of the material
- 4-5 month internship or MSc thesis investigating the causes of moisture uptake and effects of moisture on weld quality. The project will be highly experimental and hands-on, offering a unique chance to work with a novel robotic manufacturing technique
- 4-5 month internship, developing a computer vision method to track and measure, using an optical camera, the melt front of the squeeze flow in real time
- MSc thesis conducting a sensitivity study on process parameters for continuous ultrasonic welding, to better understand the physical mechanisms underlying the welding process
- MSc thesis on thermal characterization of CUW process using non-invasive sensors to monitor the process.

Your profile

You are:

- HBO or WO engineering student
- Fast learner & independent worker
- Enthusiastic about composites

Profile of your potential employer

We offer:

- A cool workspace with a lot of robots
- Access to high-end hardware
- Dynamic and experienced colleagues
- Mentoring in task scoping and implementation
- Exposure to robotic manufacturing technology know-how
- An internship renumeration.

Application Process

Interested candidates should submit their resume and a cover letter detailing their interest and relevant experience to internships-samxl@tudelft.nl. Applications will be reviewed on a rolling basis until the position is filled.

Join us at SAM XL to gain hands-on experience in cutting-edge composites research!

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