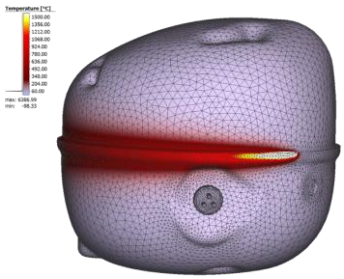
Institute of Materials Science, Joining and Forming
Kopernikusgasse 24/I, 8010 Graz

Proposals for a Master's thesis, 25.10.2025

# Thermo-mechanical simulation and process optimization for welding a newly developed compressor model

## Description

Finite element simulations (FE) are used to predict thermal and mechanical stresses during the welding process. A validated thermo-mechanical FE model is already available for existing compressor models.



As part of the development of a new compressor model, which is currently in the planning phase, a comparable simulation should be created. The aim is to predict critical temperature gradients, maximum temperatures inside the compressor housing, and the resulting deformations and stresses of the compressor shell.

The following points are to be addressed:

1. Literature research on FE simulations and training with the existing FE model
2. Evaluating the current situation
3. Planning simulations
4. Execution of simulations (Simufact Welding, model creation, parameterized calculation)
5. Planning, execution, and documentation of verification experiments
6. Summarizing the results
7. Writing the Master's thesis and a publication

## Organisation

**Supervisor:** Assoc.Prof. Dipl.-Ing. Dr.techn. Norbert Enzinger, norbert.enzinger@tugraz.at
Dipl.-Ing. Julia Puntigam, julia.puntigam@tugraz.at
**Duration:** immediately for at least 6 months, depending on assignment
**Location:** Working group Joining Technology, Kopernikusgasse 24, 8010 Graz
**Compensation**: € 3000,- (plus € 500,- success bonus)

## Further Information

For further information please contact the secretariat of the institute or the supervisor.
Tel: +43 316 873 7181, office.imat@tugraz.at, http://imat.tugraz.at