Institut für Werkstoffkunde, Fügetechnik und Umformtechnik
Kopernikusgasse 24/I, 8010 Graz

Open Master's thesis, 1.08.2025
Electron beam welding and characterisation of SLM produced parts from 316LSi feedstock

Description

In the course of a multilateral research project IMAT is assigned to join wire based LMD walls made from stainless steel 316LSi. The parts to be joined will be produced at CTU (Prag).

Joining SLM produced walls using EBW causes a complex thermal history influencing the microstructure specifically in the heat affected zone. Beside the integrity of the joint based on parameter optimization performed with bead on plate welding, the characterisation of the joint (microscopy, hardness) is key and part of this thesis.

Additional parts have to be produced for further corrosion investigations at SUT (Bratislava), FESP (Split) and UNM (Montenegro). As the parts will be further corrosion tested by further partners, some basic corrosion tests can be performed optionally within the scope of the thesis.

The following main task describe the thesis:

1. Literature review
2. Parameter optimization (bead on plate)
3. electron beam welding
4. basic characterisation (hardness, microscopy); optional: corrosion
5. documentation and interpretation
6. master thesis and publication

Organisation

Betreuer:	Assoc.Prof. Dipl.-Ing. Dr.techn. Norbert Enzinger, norbert.enzinger@tugraz.at
	EBW: Dr. techn. Florian Pixner (Florian.Pixner@TUGraz.at)
	Corrosion: Dr. techn. Rudolf Vallant (Rudolf.Vallant@TUGRaz.at)
Dauer:	~6 month
Ort:	Joining group, Kopernikusgasse 24, 8010 Graz
Entlohnung:	€ 3000,- (plus € 500,- Erfolgsprämie)

Further information

For further information please contact the secretariat of the institute or the supervisor.

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