

Data* from: Experimental Investigation of Efficiency and Deposit Process Temperature during Multi-Layer Friction Surfacing

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General information

The data set consists of three main folders:

- cross-sections
- hardness
- raw_data

which contain the main data of the experimental multi-layer friction surfacing (MLFS) processes. The numbering of the processes are associated with the layer as:

3903 - Layer 1
3904 - Layer 2
3905 - Layer 3
3906 - Layer 4
3907 - Layer 5
3908 - Layer 6

Along stack length, several samples were taken for analysis, see Fig. 1.

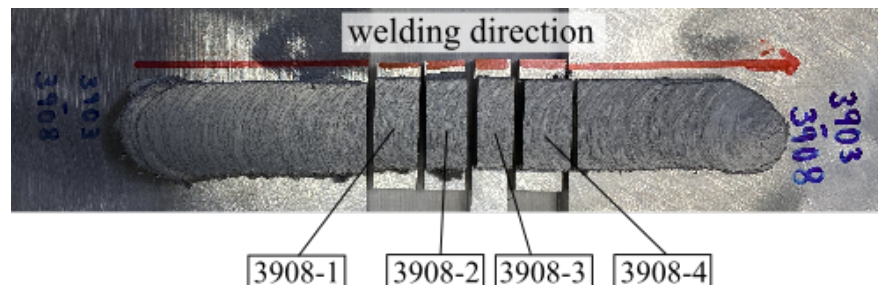


Figure 1: Sample extraction along stack length.

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1 cross-sections

The folder 'cross-sections' contains the macrographs that were taken for the different samples. They were used to measure the layer thickness. Accordingly, the macrographs with measurements are also included.

2 hardness

The results from the hardness mapping that was performed for sample 3908-4 is provided in the 'hardness' folder. The data for all points of the measurement are included in '3908-4.csv' and the corresponding plot in 'Map3908-4_map_1.jpg'.

3 raw_data

The folder 'raw_data' contains 'processed_results.xlsx', which gives the results for feed rate, remaining stud length, layer thickness and width, consumption and deposition rate as well as efficiency for each deposited layer. The subfolder 'log_files' contains the recordings by the welding equipment for all MLFS processes. The .txt files provide the x-, y- and z-displacements and forces as well as rotational speed and torque during deposition. The header mainly presents the used process parameters, i.e. 6 mm/s translational speed, 8 kN axial force and 1500 rpm rotational speed. The data of the temperature measurements using thermocouples that were inserted in the substrate during welding are provided in 'thermocouples'. For each welding process, i.e. each layer, the temperature recordings are in the corresponding .txt file. For the Layers 1, 2 and 3, eight thermocouples recorded the temperature. For the Layers 4, 5 and 6 eleven thermocouples recorded the process temperature, where the Thermocouples 9 to 11 were inserted in the layer stack.

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