Institute of Materials Science, Joining and Forming
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Master's thesis, June 19, 2017

Comparison of rotatory and linear friction welding (RFW vs. LFW)

Summary

Friction Welding is a solid state joining technology which offers many advantages compared to fusion welding. Different variants of this process are applied for many different components made from different materials and also enable dissimilar joints. However, due to the involved friction and different velocity fields applied, processes like LFW and RFW show also differences. In this thesis a simple structural steel will be joined using LFW and RFW. The processes will be compared in the main parameters with respect to energy input, flash formation, mechanical properties, microstructure, hardness, and other features.

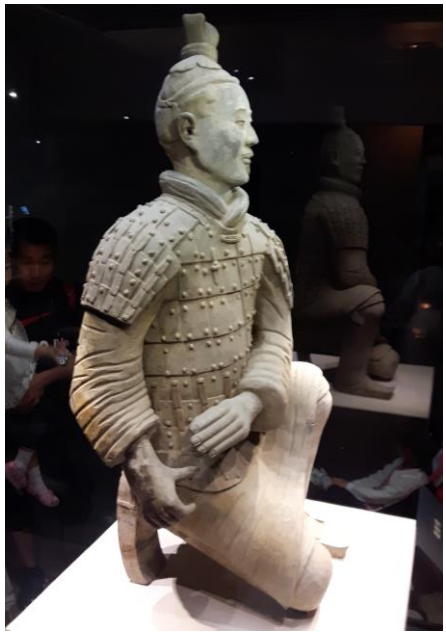

Fig. 1: Terracotta Army, Emperor Qin Shi Huang's Mausoleum in Lintong, Xian[1]

Content

- Literature review of the involved processes
- Produce welds (LFW in Xian; RFW in Graz utilizing FSW)
- Evaluation of the joints (microscopy, hardness, flash, …)
- Analyze process parameters (rotational speed, amplitude, frequency, friction and forge force)
- Derive a unique and transferable parameter to properly describe the processes

Organizational

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Kick-off: asap

Location: Graz, Xi'an

Further Information

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[1] image courtesy of Norbert Enzinger, 2017