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Magneto-forming studies at Loughborough University

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The paper will describe experimental studies of magneto-forming technology, undertaken at Loughborough University and using the existing 2 MA/100 kJ Quattro capacitor bank as power supply. Five different practical arrangements will be detailed and results presented that illustrate:

- Welding aluminium cylinders with galvanized steel cylinders in theta-pinch geometry
- Welding stainless steel cylinders with stainless steel cylinders in theta-pinch geometry
- Forming magnesium cylinders in theta-pinch geometry
- Forming magnesium plates in flat plane geometry
- Forming aluminium cylinders in Z-pinch geometry

For each arrangement, the joining quality obtained with magneto-forming is analysed at the interface as well in the adjoined materials in comparison with their pre-manufacture (as delivered) state. The used characterisation techniques include micro- and nano-indentation as well as X-ray diffraction, optical microscopy and scanning electron microscopy.

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