

1st International Symposium on Friction Stir Welding
14-16 June 1999
Rockwell Science Center, Thousand Oaks, California, USA

PROGRAMME

Monday 14 June

0800-0900 - Registration

Session 1: Process Developments 1 (Chair: Peter Fielding, TWI)

- 0900 R J Ding (NASA-MSFC) and P A Oelgoetz (Boeing);
'Mechanical property analysis in the retracted pin-tool (RPT) region of friction stir welded (FSW) aluminium-lithium 2195'
- 0930 Z Loftus, R Venable and G Adams (Lockheed Martin);
'Development and implementation of a load controlled friction stir welder'
- 1000 Coffee Break

Session 2: Applications 1 (Chair: Alan Jefferson, BAe)

- 1030 S W Kallee (TWI) and A Mistry (BMW-Rover);
'Friction stir welding in the automotive body in white production'
- 1100 O T Midling (Hydro Aluminium), J S Kvåle and O Dahl (Marine Aluminium);
'Industrialisation of the friction stir welding technology in panels production for the maritime sector'
- 1130 J Przydatek (Lloyd's Register);
'A ship classification view on friction stir welding'
- 1200 Lunch

Session 3: Weld Performance 1 (Chair: Israel Stol, Alcoa)

- 1300 G Bussu and P E Irving (Cranfield University);
'Static and fatigue performance of friction stir welded 2024-T351 aluminium joints'
- 1330 M Kumagai and S Tanaka (Sumitomo Light Metal Industries);
'Properties of aluminium wide panels by friction stir welding'
- 1400 G Biallas, R Braun, C Dalle Donne, G Staniek and W A Kaysser (DLR);
'Mechanical properties and corrosion behaviour of friction stir welded 2024-T3'
- 1430 Coffee Break
- 1500 FSW Licensees meeting (restricted to Licensees)

Tuesday 15 June

Session 4: Modelling 1 (Chair: Ole Terje Midling, Hydro Aluminium)

- 0800 A P Reynolds, T U Seidel and M Simonsen (University of South Carolina);
'Visualisation of Material Flow in an Autogenous Friction Stir Weld'
- 0830 B Yuh J Chao and X Qi (University of South Carolina);
'Heat transfer and thermo-mechanical analysis of friction stir joining of AA6061-T6 plates'
- 0900 P Dong, F Lu, J K Hong and Z Cao (Battelle);
'Analysis of weld formation process in friction stir welding'
- 0930 Coffee break

Session 5: Microstructure and Corrosion 1 (Chair: W F Bozich, The Boeing Company)

- 1000 L-E Svensson and L Karlsson (ESAB);
'Microstructure, hardness and fracture in friction stir welded AA6082'
- 1030 K Colligan (Boeing);
'Material flow behaviour during friction stir welding of aluminium'
- 1100 J Lumsden III, M Mahoney, G Pollock (Rockwell Science Center), D Waldron & A Guinasso (The Boeing Company);
'Stress corrosion susceptibility in 7075 T7541 aluminium following friction stir welding'
- 1130 Lunch

Session 6: Applications 2 (Chair: Dr M Enomoto, Showa Aluminium)

- 1230 M James and M W Mahoney (Rockwell Science Center);
'Residual stress measurements in friction stir welded aluminium alloys'
- 1300 C Jones (NASA-MSFC) and G Adams (Lockheed Martin);
'Assembly of a full scale external tank barrel section using friction stir welding'
- 1330 R Pedwell, H Davies and A Jefferson (British Aerospace Airbus);
'Application of friction stir welding to aircraft wing structures'
- 1400 H Hori, S Makita and H Hino (Nippon Light Metal Company Ltd);
'Friction stir welding of rolling stock for subway'
- 1430 Coffee break

Session 7: Process Developments 2 (Chair: Lars-Göran Eriksson, ESAB)

- 1500 T W Nelson, B Hunsaker (Brigham Young University) and D Field (TexSEM Laboratories);
'Micro-texture characterization of friction stir welds in 1100-0 aluminium'
- 1530 O T Midling (Hydro Aluminium) and G Rørvik (SINTEF);
'Effect of tool shoulder material on heat input during friction stir welding'
- 1600 C J Dawes, and W M Thomas (TWI);
'Development of improved tool designs for friction stir welding of aluminium'
- 1830 Symposium Reception and Dinner

Wednesday 16 June

Session 8: Modelling 2 (Chair: Robin Gordon, EWI)

- 0800 A P Reynolds and W D Lockwood (University of South Carolina);
'Digital image correlation for determination of weld and base metal constitutive behavior'
- 0830 O Frigaard, Ø Grong, B Bjorneklepp (Norwegian Institute of Science and Technology) and O T Midling (Hydro Aluminium);
'Modelling of the thermal and microstructural fields during friction stir welding of aluminium alloys'
- 0900 M J Russell and H R Shercliff (University of Cambridge);
'Analytical modelling of microstructure development in friction stir welding'
- 0930 Coffee break

Session 9: Weld Performance 2 (Chair: J Hinrichs, The Welding Link)

- 1000 A von Strombeck, J F Dos Santos, F Torster and M Koçak (GKSS Research Centre);
'Fracture toughness behaviour of FSW joints in aluminium alloys'
- 1030 D Kinchen, Z Li and G Adams (Lockheed Martin);
'Mechanical properties of friction stir welds in Al-Li 2195-T8'
- 1100 T. Hashimoto, S Jyogan (Showa Aluminium), K Nakata, Y G Kin and M Ushio (Osaka University);
'FSW Joints of High Strength Aluminium Alloy'
- 1130 Lunch

Session 10: Friction Stir Welding of Steel and Copper (Chair: J dos Santos, GKSS)

- 1230 D J Waldron (The Boeing Company)
'Application of friction stir welding for Delta rocket fuel tanks'
- 1300 W M Thomas (TWI);
'Friction stir welding of ferrous materials; A feasibility study'
- 1330 T J Lienert and J E Gould (EWI);
'Friction stir welding of mild steel'
- 1400 C-G Andersson (Swedish Nuclear Fuel & Waste Management Co) and R E Andrews (TWI);
'Fabrication of containment canisters for nuclear waste by friction stir welding'
- 1430 Coffee Break

Session 11: Microstructures 2 (Chair: Murray Mahoney, Rockwell)

- 1500 T J Lienert (EWI), R J Grylls (GE Aircraft Engines), J E Gould (EWI) and H L Fraser (Ohio State University);
'Microstructural evolution in friction stir welds'
- 1530 O Frigaard, Ø Grong, H Hjelen, S Gulbrandsen-Dahl (Norwegian Institute of Science and Technology) and O T Midling (Hydro Aluminium);
'Characterisation of the subgrain structure in friction stir welded aluminium alloys using the SEM-EBSD technique'
- 1600 M Strangwood, J E Berry, D M Cleugh (University of Birmingham), A J Leonard and P L Threadgill (TWI);
'Characterisation of the thermo-mechanical effects on microstructural development in friction stir welded age hardening aluminium based alloys'