**Features and benefits**

- 10µm spindle run-out
- High rigidity with a moving table
- Tool cooling
- Data logging with tool-temperature telemetry
- Video logging
- Control positional, Z and X force, and electronic deflection compensation

**Some applications**

- Ideal machine for research into FSW and friction stir processing of high-temperature materials
- Well instrumented to measure critical process forces for development of FSW tool materials and process parameter development
- Typical areas of interest include:
  - Joining titanium for aerospace structures such as fuel tanks
  - Joining steels for marine applications
  - Processing steels with increased toughness and hardness such as for machine blades and knives
  - Processing oxide dispersion-strengthened (ODS) alloys for use in high-temperature creep-resistant applications

**Technical specification**

- Working envelope: 2000 x 700 x 800mm
- No. of axes: 4
- Spindle power: 37kW
- Spindle speed: 0–3000RPM
- Spindle torque: 500Nm
- Z force: 0–100kN
- Force other axes: 0–45kN
- A axis tilt: +10°