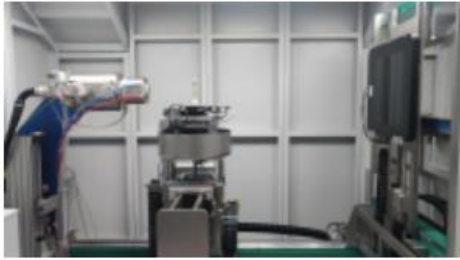


Materials Integration & Joining Technologies Laboratory Activities (20h)

Activity/Lab experience	Instrument/equipment	Student role
Joint manufacturing (surface preparation, slurry preparation)	Laboratory glassware and equipments for joints manufacturing	Active use of laboratory equipments
Thermal processing for joints manufacturing	Tubular furnaces/chamber furnaces	Observation of test/measurement execution
Samples preparation for morphological and thermo-mechanical characterization	Cutting machine, machining equipment for precision surface finishing and polishing of materials	Active use of laboratory equipments
Morphological characterization	Optical microscopy	Preparation and observation of samples Active use of laboratory equipments

Activity/Lab experience	Instrument/equipment	Student role
Morphological characterization	Scanning electron microscopy (SEM)	Preparation and observation of samples Active use of laboratory equipments
Non-destructive tests on joints- microCT measurement	Micro CT	Observation of test/measurement execution
Mechanical tests on joints (shear test, torsion test)	Universal testing machine for mechanical characterization	Execution of tests by the teacher. Volunteers will be called upon to attempt to perform some operations. The raw data of the curves obtained from the test instruments will be exported for further analysis by the students.

Collection of pictures and images



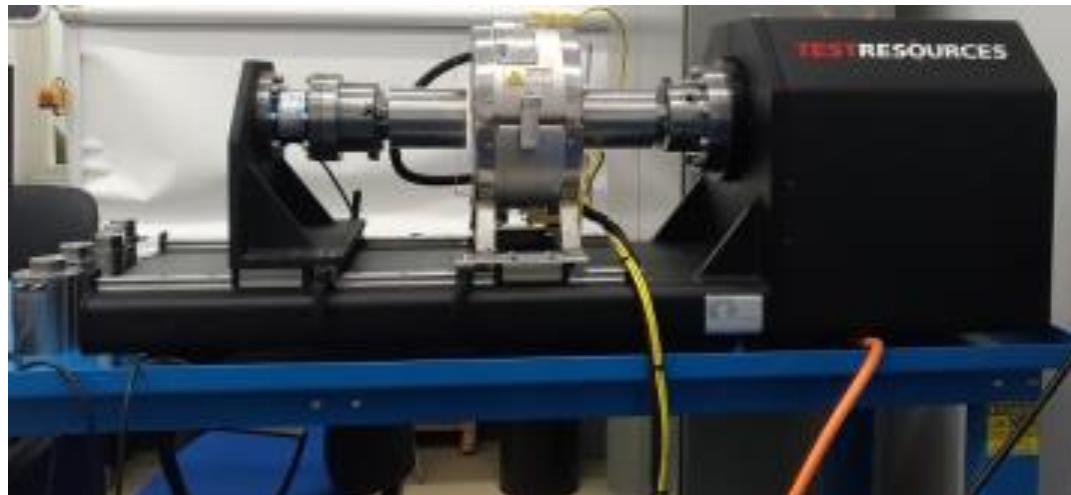
Scanning Electron Microscopy



*Universal testing machine
(Zwick/Roell)*



*Micro-CT (built up by
Fraunhofer IKTS)*



Equipment for torsion tests

Collection of pictures and images



Furnaces for specimens preparation



Polishing machine



Cutting machine