

Custom-built Computed Tomography with in-situ mechanical testing (tensile, compression, bending, load cell 10 kN), chamber size 3.5 m x 2.5 m x 2.5 m; samples up to 0.5 m x 0.5 m x 0.5 m resolution of about 5 μm (*).

Multipurpose joining/brazing/soldering facilities operating in vacuum, inert, and reactive atmospheres, up to 1700 °C (up to 1800 °C in air (*).

Universal tensile/compression machine operating up to 1200 °C in inert atmosphere, load cell 50 kN, with high precision laser extensometer in micro and macro range with 0.7 μm of resolution (*).

Friction Stir Welding with a high-load capacity (100 kN vertical force, 600 Nm torque), with CNC control and high precision sensors to manage and monitor the welding parameters in real-time (*).

Thermographic test system equipped with FLIR thermal camera A6751sc and Ytterbium pulsed fiber laser source for non-destructive testing (NDT) of welded joints and on-line monitoring of welding processes.

Non-destructive tests based on **impulse excitation technique** for measurement of Young modulus, shear modulus, Poisson ratio and internal friction/damping, up to 1500 °C; it acts as quality control tool by comparing resonant frequencies. It works also as dilatometer.

Torsion test system designed to measure torsional properties up to 25 Nm and 800 °C.

Field Emission Scanning Electron Microscopy with EDS and EBSD, resolution about 2.5 nm (*).

Six axis industrial robot equipped for: laser welding (4 kW diode laser source); arc welding (GMAW and cold metal transfer, CMT); laser surface hardening and heat treatments; wire arc additive manufacturing (WAAM) (*).

Split Hopkinson Bar apparatus with high speed visible and infrared cameras and fast data acquisition systems to evaluate the mechanical response of materials with test durations less than 1 ms (*).

Electrodynamic testing machine for combined axial-torsional fatigue tests, with maximum axial load of 15 kN, torsional moment of 70 Nm, load frequency of 50 Hz (*).

Ultrasonic testing machines for Very-High-Cycle Fatigue tests up to 10 billion cycles at room and high temperature (*).

(*) co-funded by Regione Piemonte Project INFRA-P – 2017

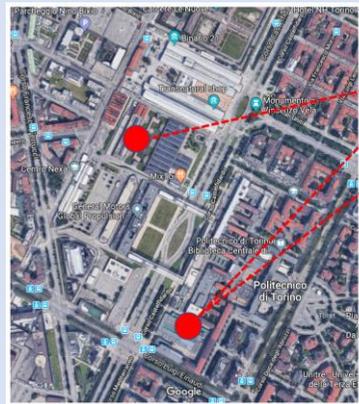
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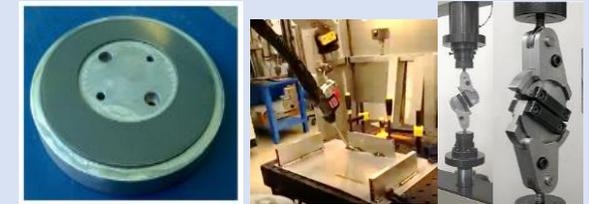
J-TECH@POLITO
(CT-scan,
underground)

<http://www.j-tech.polito.it/>

<https://www.polito.it/ricerca/infrastrutture/dynlab4jmat/>

Virtual Tour:

https://youtu.be/bS_f5g82hDY



J-Tech@POLITO is a research center for advanced joining technologies funded by Politecnico di Torino and Regione Piemonte, Italy.

Our mission is to provide advanced expertise and technology transfer on joining materials and processes, modelling of joints, testing and monitoring of joined components.

We are available for outsourced research, problem solving, project management, custom hands-on training and custom lecturing for companies and SMEs

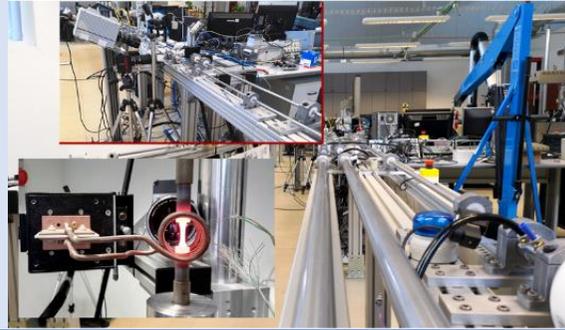
Virtual Tour:

https://youtu.be/bS_f5g82hDY

Laser Welding, Arc Welding, Laser Surface Heat Treatments, WAAM



Split Hopkinson Bars



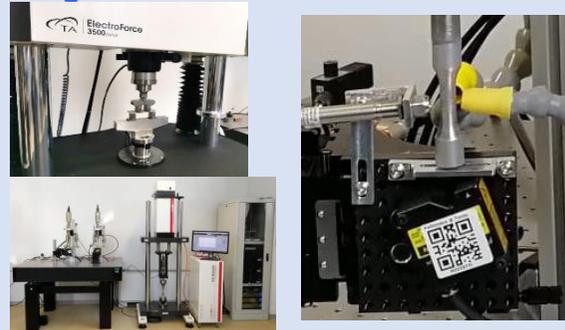
X-Ray Computer Tomography



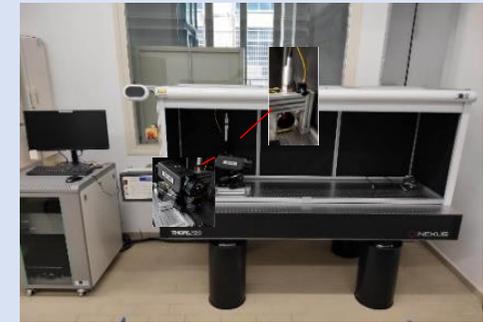
Friction Stir Welding



Axial-Torsional Fatigue Tests, Very-High-Cycle Fatigue



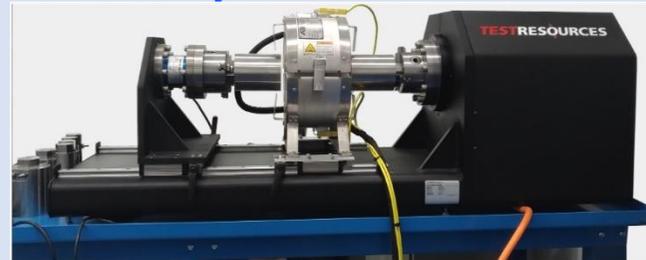
NDT by infrared thermography



Air and Vacuum Furnaces



Torsion Test System



Field Emission Scanning Electron Microscopy with EDS and EBSD/optical microscopy



Impulse Excitation Technique



Universal Tensile/Compression Machine



FEM Welding Simulation

