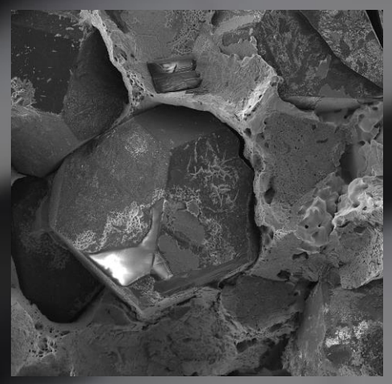
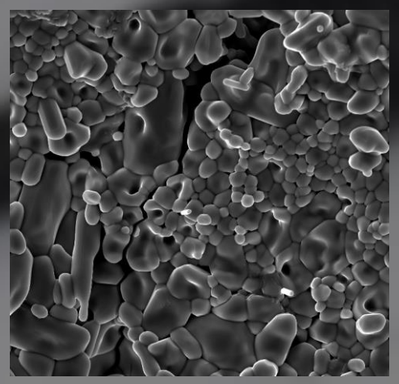
DYNLab is an integrated experimental and numerical laboratory operating in the field of materials and structures behaviour under extreme loading conditions. Very high cycle fatigue, impact and high strain-rate and high temperature scenarios are investigated with dedicated experimental facilities and numerically analysed with non-linear finite elements codes. DYNLAb is strongly involved in research and development of new advanced and exotic materials.

Politecnico di Torino

DYNLAB

Department of Mechanical and Aerospace Engineering
Corso Castelfidardo 30/A, 10129 Torino – Italy
tel.: +39 011 0903540 – website: dynlab.polito.it

LAB@PoliTO
MATERIALS & JOINTS

DYNLab is partner of the Research infrastructure DJLab founded by the Piedmont region.

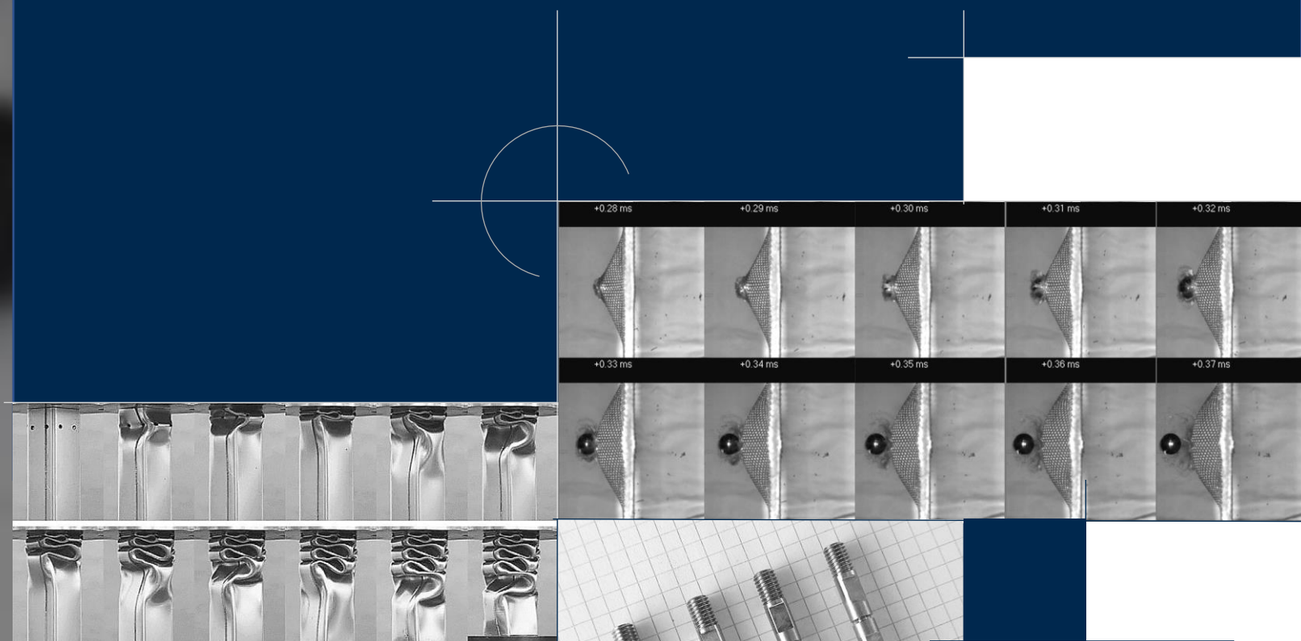
DYMAT
www.dymat.org

DYNLab is recognized by DYMAT, the European association for the promotion of research into the dynamic behaviour of materials and its applications.

DYNLAB

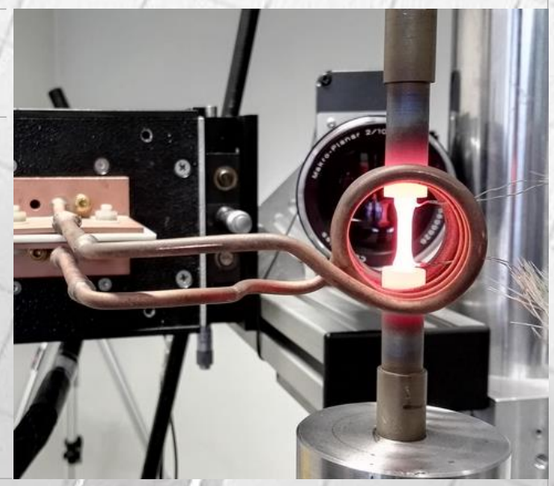
Material Behaviour in Extreme Loading Conditions

Your partner for complex analysis



Politecnico di Torino

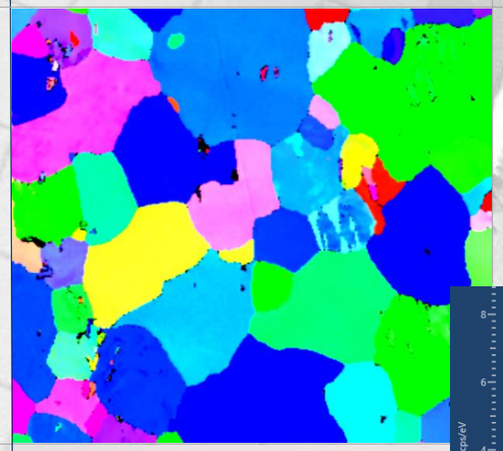
- 2 Universal tension-compression Zwick electro-mechanical machine (5 and 100 kN)
- 1 Universal tension-compression Dartec HA100 servo-hydraulic machine
- 1 Fast electro-mechanical tension-torsion TA Instruments 3550 machine
- 4 Ultrasonic Very High Cycle fatigue test rigs
- 5 Hopkinson bar systems with semiconductor strain-gages and fast data acquisition systems (up to 100 MHz): direct tensile and compression tests, miniaturized setup for ultra-high strain-rate, 3 point bending tests, Brazilian and spalling tests (brittle), triaxiality tests (notched specimens), dynamic fracture toughness tests
- 1 High speed system configurable as Gas Gun or Shock tube
- 3 Induction heating systems for high temperature mechanical tests
- 1 Vacuum chamber for mechanical test in controlled atmosphere



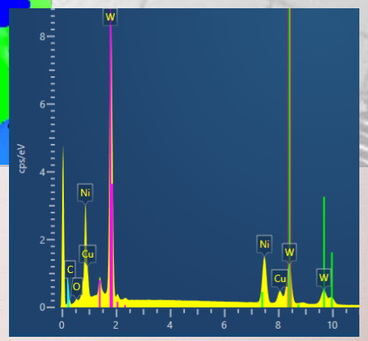
DYNLAB

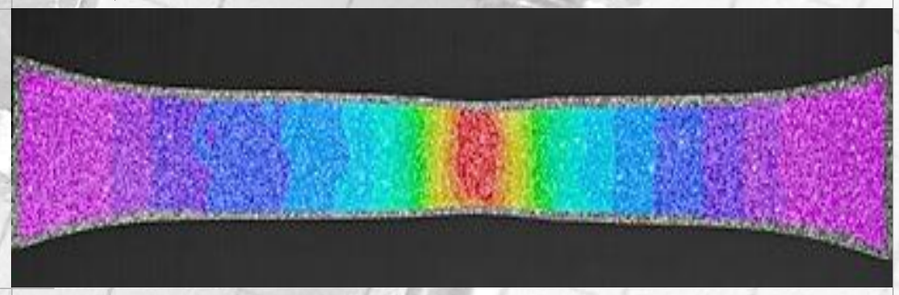
DYNLab staff has considerable experience in materials science, strength of metals, fracture and mechanical testing related to metals, ceramics, polymers and composites, together with a good metallurgical knowledge of their microstructures and properties. The staff has significant expertise in design of machine components and joined structures, impact response prediction, failure and stress analyses, fractography, and materials selection.
DYNLab has been involved in numerous projects funded both by the Piedmont region, by the Italian Ministry of University and Research and by private companies. Several EU projects used DYNLab equipment. DYNLab is part of a research network with European research centers (CERN, GSI, IFAM, JRC) and Universities all around the world.

ANALYSIS

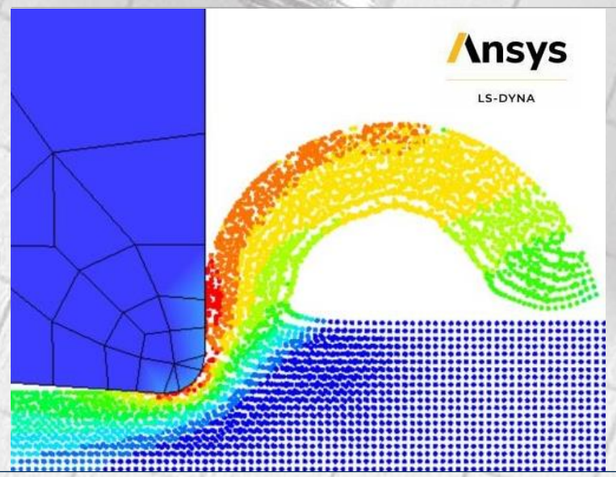


- 2 High speed cameras (Photron SA5 and Photron AX50) with framerate up to 1 million frame/s
- 1 Fast Infrared camera (FLIR X6900sc SLS) up to 30000 image/s
- 2 Williamson Multi-wavelength Pyrometers
- 1 TESCAN MIRA3 FE-SEM with Oxford Instruments Energy Dispersive Spectroscopy (EDS) and Electron Backscatter Diffraction (EBSD)
- MECATECH 250 SPC polishing machine
- Agar scientific High Resolution Sputter Coater
- Digital Image Analysis tools (2D and 3D)





NUMERICAL SIMULATIONS



Analysis with non-linear numerical codes (Ansys LS-Dyna)
Finite elements and meshless simulation tools
Explicit and Implicit integration
Fluid-structure interaction
Numerical optimization for parameters identification (LS-OPT)
Topology optimization (LS-Tasc)

Plasticity
Crashworthiness problems
Human models and biomechanics
Shocks and impacts scenarios
Ballistics and Explosions
Vibrations and fatigue
Strength models, Equation of state, Failure
Metals, Ceramic, Polymers and Composites models