ING-IND/14
MECHANICAL DESIGN AND MACHINE CONSTRUCTION

Labs

♦ Testing facilities

An hydraulical MTS testing machine, for axial tensile/compressive static and fatigue loads up to 250kN. The equipment is controlled by a 407 MTS hardware while load signal, crosshead displacements and specimen elongation data are collected by a National Instrument card and Labview software.

A tension-torsion custom designed electro-mechanical testing machine is available, based on a Schenck-Trebel four-columns frame, which allows axial and torsional loads up to 100kN and 1000Nm, respectively. Loads are acquired by a custom-made biaxial load cell, while displacements and rotations are recorded by means of digital encoders embedded in the actuators. The real-time control is provided by a National Instrument FPGA card programmed in Labview environment. The two axes can be independently loaded or displacement controlled. The equipment, in conjunction with proper specimen geometries, allows the execution of multiaxial tests characterized by very different loading conditions and stress states.

♦ Digital image acquisition equipment for DIC analysis

The group has a consolidated expertise in surface strain measurements relying on the "*white light speckle image correlation*" technique. A high resolution digital image acquisition framework can be used for the experimental activities, based on 2208×3000 pixel PixeLink cameras, controlled by a personal computer through a FireWire high speed connection. The system can be used with different testing machines available in the lab. The acquired data can be properly post-processed to quantify full-field displacements of the specimen with a spatial resolution up to a fraction of a pixel and strains during test execution.