MATERIALS CHARACTERIZATION

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The research in this area can be divided into two main blocks:

- the mechanical characterization with convectional procedures of non-convectional materials. In particular, non-convectional building material like straw bale….. are tested to understand the mechanical properties under static and dynamic loads.

- the development of innovative and unconventional procedures and testing techniques to be performed in the laboratory and on site for studying building materials, e.g. mortars, bricks, wood, … with the aim of determining their mechanical and physical properties, such as compression, shear or tensile strength, the elastic modulus, the capillary rise velocity, etc

In particular special procedures for testing single materials samples which may have irregular shapes or portions of structural elements taken on-site, also on historic and/or earthquakes damaged structures. A further innovative development in the procedures for the mechanical characterization of materials and assessment of the structure - environment interaction, is represented by the coupling of mechanical tests with non-destructive diagnostic techniques (sonic tests, IR thermography, digital correlation of images, acoustic emission ...) or monitoring systems, also wireless (e.g. potential embedded sensors for salt content monitoring in masonry materials).
On-site, minimally invasive testing equipment (e.g. penetrometers for mortars and wood, hammers …) and combined procedures are used to characterize the materials and assess the health-state of the structures.

Fig. 1. View of the LISG laboratory (Colla).

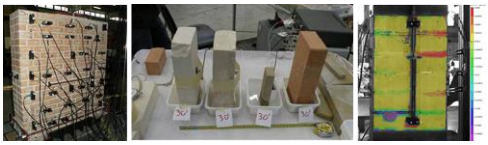

Fig. 2. Monitoring of physical-mechanical tests using acoustic emission sensors or DIC (Colla).

Fig. 3. Compressive test on straw bale (Molari).

Fig. 4. On-site mechanical characterization of historic mortars by micro-destructive testing (Colla).

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RESEARCH PROJECTS

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