Antonio Formisano

Recent scientific developments on the use of agricultural wastes for green building products

Sustainability is of fundamental importance for the construction industry: in recent decades researchers focused on supplementing building components with multiple natural fibres, evaluating their mechanical performance and application fields. In this field, the common plasters are usually equipped with glass fibre mesh to avoid crack patterns due to shrinkage. Natural fibres, thanks to their high tensile resistance, can represent a green solution to solve this problem. Starting from these premises, this presentation investigates the properties and the mechanical characteristics of building products under form of bricks and plasters manufactured with different natural fibres (hemp, jute or coconut). The first phase aims at identifying the ideal mixture between fibres and the basic component (mortar) to improve workability and avoid altering the water/binder ratio. The performed physical tests provide useful information for the evaluation of the consistency and the workability of the compound. Moreover, the mechanical properties of the examined building products are evaluated through bending and compression tests. For each test, the performances of fibre-reinforced samples are compared to the reference specimens manufactured without fibres. Finally, a comparison among the different green products is done, highlighting the best performances offered by the different fibres investigated.