

# **Recycling organic industrial waste in the brick production: effects on petrophysical properties and durability of new bricks**

*(Proposer: Claudio Mazzoli)*

For millennia clay bricks have been used as building materials for their excellent properties. From both environmental and economic perspectives, bricks are still a valuable, healthy and efficient construction material. In the last years, extensive research has been conducted on the industrial brick production promoting environmental protection and supporting sustainable development (Dondi et al., 1997a; Dondi et al., 1997b; Demir, 2008; Raut et al., 2011; Zhang, 2013; Muñoz Velasco et al., 2014; Neves Monteiro & Fontes Vieira, 2014; Bories et al., 2014).

The fulfilment of a sustainable production is twofold, determining a reduction in the exploitation of new geo-resources, and mitigating the problem of waste accumulation and management, reassessing residual materials as secondary sources for a new environmental friendly material production. The great amount of waste generated by industrial processes and the increasing attention to environmental issues, indeed, stimulated a progressive interest in the reuse of waste and addressed research to environmental friendly development of construction materials.

Numerous studies have been carried out in the last decades re-using waste as a successful alternative resource in the production of bricks, such as those tested to increase porosity by recycling organic compound, e.g. paper (Demir et al., 2005; Sutcu & Akkurt, 2009; Rajput et al., 2012; Sutcu et al., 2014), cotton (Rajput et al., 2012), tea (Demir, 2006), rice (Chiang et al., 2009), tobacco (Demir, 2008), sudwaste (Eliques-Quesada et al., 2012b) or reusing biomass (Fernández-Pereira et al., 2011; Pérez-Villarejo, 2012; Barbieri et al., 2013) and biodiesel (Eliques-Quesada et al., 2012a).

The main aim of this project is therefore to investigate the possibility of recycling a number of organic waste materials produced from local (e.g. at a regional scale) industrial activities as temper for the preparation of new types of bricks, which satisfy the requirement of energy saving, production cost reduction and preservation of increasingly meagre raw material sources. The influence on petrophysical properties and durability will be investigated.

Collaborations: Department of Mineralogy and Petrology, University of Granada; several local industries of different compartments.

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