

# Grapevine shoots for improving thermal properties of structural fired clay bricks: New method of agricultural-waste valorization

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For decades the construction industry has been focused on developing new materials for minimizing environmental impact and improving the building insulation envelope. The use of certain wastes as additives for construction materials have been shown to be the best alternative. In particular, the fired clay brick industry has been highlighted as an optimal sector for incorporating such residues due to the large amount of mass flow and high temperatures involved in the manufacturing process. This paper assesses the feasibility of using wood chips from a pruned grapevine shoot as an additive for manufacturing fired clay bricks. Samples with different percentages of the additive were formed and tested. It is concluded that a maximum of 10% of wood chips can be added, which produces compressive strength values above 5 N/mm<sup>2</sup>. In spite of thermal conductivity being reduced up to 50%, water absorption is raised up to 30%. Thus, bricks must be coated to prevent masonry damage. © 2017 American Society of Civil Engineers.

Agro-waste

Compression strength

Fired clay brick

Grapevine shoot

Thermal insulation

Valorization

Additives

Agricultural wastes

Brickmaking

Building materials

Compressive strength

Construction industry

Environmental impact

Manufacture

Thermal conductivity

Thermal insulation

Water absorption

Wood products

Agro-wastes

Compression strength

Fired clay bricks

Grapevine shoot

Valorization

Brick

additive

compressive strength

construction material

insulation

shoot

solid waste

wood

Brick

Insulation

Plant Residues

Shoots

Thermal Conductivity

Thermal Properties

Vitis