

ABSTRACT

Concrete is one of the most used materials in the construction industry due to its strength, durability, and economic properties. A disadvantage of its high thermal conductivity is associated with increased energy consumption in homes and CO₂ emissions; An alternative is using lightweight aggregates such as pumice in concrete, which reduces weight and improves thermal properties. However, using this aggregate naturally affects mechanical properties such as compressive strength. For this reason, the present investigation aimed to design concrete with pumice that considers particle characteristics such as its shape, granulometry, and dosage, allowing a resistance suitable for portable wall systems and adequate thermal insulation. The design of the concrete mixture was carried out by preparing a control concrete of 21 MPa and concrete with the replacement of fine and coarse aggregates in proportions of 10%, 15%, 20%, 30%, and 20-60% of pumice, with shape and size treatment, evaluating the compressive strength, densities and statistical analysis between these. The results have revealed differences between the analyzed samples, verifying the form's incidence in the concrete's compressive strength. Subsequently, the coefficient of thermal conductivity between the control concrete and the concrete with the best resistance will be reduced, showing a decrease in the coefficient, thus improving thermal insulation.

Keywords: Concrete, pumice, compressive strength, thermal conductivity, lightweight concrete, thermal insulation.

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