

Understanding the effect of porosity on the mechanical and thermal performance of glass foam lightweight aggregates and the influence of production factors

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Abstract

The presence of lightweight aggregates (LWAs) in concrete reduces the density and thermal conductivity of concrete at the expense of its mechanical strength. This research quantifies the influences of the pore structure, characterized using micro computed tomography (μ -CT), on the thermal and mechanical performance of 38 types of LWAs made with glass foam from recycled glass. A higher porosity and smaller pore size distribution allow the achievement of higher mechanical strength and lower thermal conductivity. Such a pore structure can be obtained by reducing the size of the particles of the foaming agent and by increasing the temperature of the expansion process..

Keywords

Porosity, Porous aggregates, Lightweight concrete, Mechanical strength, Thermal conductivity, Glass foam.