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MICROSTRUCTURE CARACTERIZATION OF CERAMIC FLOOR TILES WITH THE INCORPORATION OF WASTES FROM CERAMIC TILE INDUSTRIES

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ABSTRACT

Ceramic floor tiles are widely used in buildings. In places where people are bare feet, the thermal sensation of cold or hot depends on the environmental conditions and material properties including its microstructure and crustiness surface. The introduction of the crustiness surface on the ceramic floor tiles interfere in the contact temperature and also it can be an strategy to obtain ceramic tiles more comfortable. Materials with low conductivities and densities can be obtained by porous inclusion are due particularly to the processing conditions usually employed. However, the presence of pores generally involves low mechanical strength. In this work, porous ceramic tiles were obtained by pressing an industrial atomized ceramic powder incorporated with refractory raw material (residue from porcelainized stoneware tile polishing) and changing firing temperature. Raw materials and obtained compacted samples were evaluated by chemical analysis, scanning electron microscopy (SEM), energy-dispersive spectrometry (EDS), thermogravimetric analysis (TGA), and differential thermal analysis (DTA). Thermal (thermal conductivity and effusivity) and physical (porosity) measurements were also evaluated. The work has as objective to correlate the microstructure of the porous ceramic tiles obtained with your thermal and mechanical properties. The results show that by increasing the porosity, the thermal conductivity and effussivity decrease and improve the comfort by contact.

Keywords: ceramic floor tiles; microstructure, thermal and mechanical properties.