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Experimental investigation of waste PET in natural sand bricks

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At present most of the developed countries invest on the prevention of waste resources and reduction of environmental pollution. Recycling of PET waste is one of the measures to be taken due to enormous increase in non-renewable garbage especially solid waste generated from municipal waste. Polyethylene Terephthalate (PET) is widely used for manufacturing plastic bottles, the use of shredded plastic has known a rising interest as recycled materials. Therefore recycling of waste PET to produce building materials like mortar, bricks, tiles, roof-sheets is best solution for discarding of such plastics. The aim of this research work is to experimentally investigate the usability and feasibility of PET (Polyethylene-terephthylene) in cementless sand bricks by evaluating its mechanical properties and total production cost. In this work, powdered PET waste bottles are used to produce cementless bricks with different proportions of river sand, black sand and clay. 20 specimen were prepared with 15%, 20%, 30%, 40% and 45% volume of waste plastic powder as partial replacement. Specific weight, thermal conductivity, water absorption capacity, porosity and compression strength of bricks are tested. The overall results show the usability and feasibility of the recycle of PET waste. The specimen with 30%, 40% and 45% waste PET as a partial replacement of sand show significant improvement in compressive strength and with low density. Finally, cost analysis show cost effective way of producing sand bricks without the use of cement contributing to minimize waste, prevent environmental pollution and saving energy.

Biography

Anil Antony Sequeira is working as an Assistant Professor – Senior Scale in Mechanical department, School of Engineering and IT at Manipal University, Dubai. He received his BE degree in Industrial & Production Engineering from Manipal Institute of Technology, Manipal, India, the Master of Science in Engineering (by research) specialization in CNC Machining from St. Joseph Engineering College, Mechanical Research Centre, Mangalore, Karnataka, India, in 2012. He is the Subject Coordinator and Area Coordinator, and he participates in curriculum development activities and supervises laboratories. He is involved in off-campus learning such as practicums and internships and participates in research projects and research teams, and undertakes research projects.

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