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Processing & characterization of eco-friendly interlock construction blocks for earthquake regions

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Brick and block are construction materials, used for building houses and apartments. Bricks and blocks are used worldwide in developed and developing countries alike, sometimes due to strong cultural aspects, long time tradition or a strong symbol of construction. There are over 1.3 trillion bricks manufactured each year worldwide out of which 75% are made in China and South Asia. Pakistan as the 3rd largest brick producing country in world, this shows the importance of the industry in the country. The International Energy Agency points out that commercial and residential buildings made of traditional bricks consume about 32% global energy and 10% of continuous direct energy-related CO₂ emissions for cooling or heating purposes. Pollution kills more people each year than wars, smoking, disasters and hunger, also causing huge economic damage, a study says. Almost half the total deaths occur in just two countries. One of out every six premature deaths in the world in 2015, about nine million was attributed to disease from toxic exposure, according to a recently major study released in the Lancet medical journal. The report says, costing some \$4.6 trillion in annual losses or about 6.2 per cent of the global economy.

Based on above mentioned issues, the goal of the study is to develop a clean production that can utilize soil, fiber, fly ash or sand. Replacing bricks with alternatives that are safer, cheaper, cleaner and faster to build. Interlocking property make it as a cost effective and sustainable construction material which has potential to bring durable and affordable homes to developing counties around the world. The main benefit of manufacturing unfired cementitious bricks is that it requires lesser energy than fired bricks and hence the release of carbon dioxide into the atmosphere is 80% less than fired bricks. Soil, fiber, cement and foaming agent to produce light weight, low cost and environmental friendly construction interlock products. Due to their interlocking, to induce at some extent flexibility and light weight properties, it tolerates more intensity of earthquake than brick building.

Biography

Safeer Ahmad Arbab is currently an Assistant Professor at Department of Physics, founder and project Director of center of Material science at Islamia College Peshawar, Pakistan. He earned an MSc in Physics from the University of Peshawar, M.Phil. in Nuclear Physics, and a Ph.D. in Material science. His research interests include Ceramics, clay bricks and eco efficient blocks. Dr Safeer is also serving as a director of ORIC (office of research, innovation and commercialization) at Islamia College Peshawar since 2015. He organized different seminars, workshop etc for the Encouraging of entrepreneurship in university, research outputs and link between academia and research institutions at national and international level.

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