

TITLE OF ARTICLE: Thermal Behaviour and Admissible Compressive Strength of Expanded Polystyrene Wall Panels of Varying Thickness

AUTHOR (S): Anthony Nkem Ede, Abimbola Ogundiran

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ABSTRACT: Over the years, clay bricks, concrete hollow blocks and other conventional construction materials have been in use and they have stood the test of time. However, in the recent times, modern building materials that conform to the standards of international regulations, meet up with the basic needs of safety, economy, good aesthetics and constructability desired for engineered structures and satisfies the contemporary expectations of sustainability and durability have been introduced to the construction industry in the more advanced nations. In the developing nations such as Nigeria such is not the case as the building industry is faced with shortage of affordable building and the masses have difficulties building houses of their own because of the excessive costs of building materials such as reinforced concrete and sand-crate blocks and the high cost of labor. As a way of finding solution to these housing challenges, this research considers EPS wall panel as a possible substitute to the conventional concrete-sand crate blocks normally used in Nigeria for walls. This research seeks to investigate the thermal behaviour and the compression strength of 3-D wall panel with insulation core of polystyrene and concrete shell. The thickness of the expanded polystyrene and of the concrete shell was varied for this research. The thermal transmittance and reactance of these various wall panels was obtained with the aid of a computer program in Microsoft Excel developed according to ENISO 6946. The results obtained on the admissible axial loads and thermal resistance demonstrate that the application of this innovative construction system is feasible and will be a good substitute for traditional concrete hollow blocks that are predominantly used in Nigeria.