

Title: Strength and toughness of lightweight foamed concrete with different sand grading

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Abstract: Lightweight Foamed Concrete (LFC) is one of the recent advancement of concrete technology in civil engineering. Different gradation of sand in lightweight foamed concrete will change the physical properties of the concrete. This paper aims to study the fresh and hardened properties of lightweight foamed concrete with density of  $1300 \pm 50 \text{ kg/ m}^3$  that produced by using different gradations of sand. Four categories of sand gradations, ranging from 2.36 mm to 0.60 mm were used. Cube and prism specimens were cast and cured in water curing as well as 7-day initial water curing followed by air curing conditions. The measured spread values indicated that the finer sand used in the foamed concrete has lowered its workability and increases its water to cement ratio for desired consistency and stability. It was noted that the specimens prepared with 0.60 mm sand have obtained the highest compressive and flexural strengths as well as flexural toughness compared with the specimens prepared with coarser sand gradations.