



Aggregate effect on the performance of lime-based mortars

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Lime-based mortars have been used as a building material since antiquity. Their physico-mechanical properties mainly depend on the type and grain size distribution of aggregates, the quality of lime, the binder/aggregate ratio and the water/binder ratio. These are the key parameters that control the properties of the end-products both in the fresh and hardened state. The present study focuses on the performance of air lime mortars produced with different types of aggregates. Furthermore, two different mixing methods were investigated; in some mixtures, lime and sand were initially dry-mixed in a laboratory mixer for a few minutes before the addition of water, while in some others water was added prior to the addition of the dry raw materials. In total, five mix designs were prepared and cured under controlled temperature and relative humidity conditions for at least 90 days. The most important physico-mechanical properties of all mix designs were determined, including the open porosity, apparent density, capillary absorption, flexural and compressive strength. Furthermore, the carbonation depth of the composites was also determined via the phenolphthalein test. The experimental results clearly demonstrate that there are significant differences in the performance of the studied mortars. The highest strength values were acquired for the mix design containing calcareous sand from Cyprus, in which dry-mixing of lime and sand was performed prior to the addition of water. The study is funded by the Republic of Cyprus and the European Committee through the Cyprus Research Promotion Foundation (Project KOINA/MERA.NET/0316/04).

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