

Behaviour of Lightweight Expanded Clay Aggregate Concrete Exposed to High Temperatures

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Abstract : This paper is concerning the issues of behaviour of lightweight expanded clay aggregates concrete exposed to high temperature. Lightweight aggregates from expanded clay are produced by firing of row material up to temperature 1050°C. Lightweight aggregates have suitable properties in terms of volume stability, when exposed to temperatures up to 1050°C, which could indicate their suitability for construction applications with higher risk of fire. The test samples were exposed to heat by using the standard temperature-time curve ISO 834. Negative changes in resulting mechanical properties, such as compressive strength, tensile strength, and flexural strength were evaluated. Also visual evaluation of the specimen was performed. On specimen exposed to excessive heat, an explosive spalling could be observed, due to evaporation of considerable amount of unbounded water from the inner structure of the concrete.

Keywords : expanded clay aggregate, explosive spalling, high temperature, lightweight concrete, temperature-time curve ISO 834

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