

Accepted Manuscript

Pozzolanicity of finely ground lightweight aggregates

Prannoy Suraneni, Tengfei Fu, Vahid Jafari Azad, O. Burkan Isgor, Jason Weiss

PII: S0958-9465(16)30764-8

DOI: [10.1016/j.cemconcomp.2018.01.005](https://doi.org/10.1016/j.cemconcomp.2018.01.005)

Reference: CECO 2974

To appear in: *Cement and Concrete Composites*

Received Date: 24 November 2016

Revised Date: 24 November 2017

Accepted Date: 2 January 2018

Please cite this article as: P. Suraneni, T. Fu, V.J. Azad, O.B. Isgor, J. Weiss, Pozzolanicity of finely ground lightweight aggregates, *Cement and Concrete Composites* (2018), doi: [10.1016/j.cemconcomp.2018.01.005](https://doi.org/10.1016/j.cemconcomp.2018.01.005).

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Pozzolanicity of finely ground lightweight aggregates

Prannoy Suraneni, Tengfei Fu, Vahid Jafari Azad, O. Burkan Isgor, and Jason Weiss*

Civil and Construction Engineering, Oregon State University, Corvallis, OR 97331, USA.

Corresponding author Email: jason.weiss@oregonstate.edu

Abstract

This paper examines the pozzolanic behavior of finely ground lightweight aggregates with a mean particle size between 4 – 26 μm . Cement pastes are made with a 20 % mass replacement of cement with finely ground lightweight aggregates, fly ash, quartz, and limestone in addition to a control paste with no replacement. Isothermal calorimetry, thermogravimetric analysis, and compressive strength testing as well as thermodynamic calculations are performed on these pastes. Isothermal calorimetry and compressive strength testing are shown to not be able to clearly distinguish and quantify the pozzolanic response of the finely ground lightweight aggregates, fly ash, quartz, and limestone when they are used in cement pastes. However, thermogravimetric analysis and thermodynamic calculations clearly show that the finely ground lightweight aggregates are pozzolanic through the consumption of calcium hydroxide. A pozzolanic reactivity test based on isothermal calorimetry also confirms that the finely ground lightweight aggregates are pozzolanic. These results indicate that finely ground lightweight aggregates are pozzolanic and could be used in concreting applications.

Keywords

Lightweight aggregates; Pozzolan; Supplementary cementitious materials; Isothermal calorimetry; Thermogravimetric analysis; Thermodynamic modeling

Download English Version:

<https://daneshyari.com/en/article/7883874>

Download Persian Version:

<https://daneshyari.com/article/7883874>

[Daneshyari.com](https://daneshyari.com)