

## Accepted Manuscript

Title: The effect of alkaline earth carbonates on the microstructure and mechanical properties of impermeable and lightweight ceramics

Authors: M. Lassinantti Gualtieri, E. Colombini, Denia Mazzini, Claudio Alboni, Tiziano Manfredini, Cristina Siligardi



PII: S0955-2219(18)30497-7  
DOI: <https://doi.org/10.1016/j.jeurceramsoc.2018.08.011>  
Reference: JECS 12036

To appear in: *Journal of the European Ceramic Society*

Received date: 17-5-2018  
Revised date: 9-8-2018  
Accepted date: 10-8-2018

Please cite this article as: Lassinantti Gualtieri M, Colombini E, Mazzini D, Alboni C, Manfredini T, Siligardi C, The effect of alkaline earth carbonates on the microstructure and mechanical properties of impermeable and lightweight ceramics, *Journal of the European Ceramic Society* (2018), <https://doi.org/10.1016/j.jeurceramsoc.2018.08.011>

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.

## *The effect of alkaline earth carbonates on the microstructure and mechanical properties of impermeable and lightweight ceramics*

M. Lassinanti Gualtieri<sup>a\*</sup>, E. Colombini<sup>a</sup>, Denia Mazzini<sup>b</sup>, Claudio Alboni<sup>b</sup>, Tiziano Manfredini<sup>a</sup>,  
Cristina Siligardi<sup>a</sup>

<sup>a</sup> *Department of Engineering “Enzo Ferrari” Iln, University of Modena and Reggio Emilia, Via Pietro Vivarelli 10, 41125, Modena, Italy*

<sup>b</sup> *Colorobbia Italia S.P.A., Via Pietramarina 53, 50053, Sovigliana, Vinci, Florence, Italy*

\*Corresponding author

Phone: +39 059 2056282

E-mail address: [magdalena.gualtieri@unimore.it](mailto:magdalena.gualtieri@unimore.it)

---

### **Abstract**

Lightweight impermeable ceramic bodies were designed by combining pore templating and controlled viscous sintering through in-situ crystallization. Various amounts of limestone were added to a glass-fluxed low-temperature stoneware tile formulation. Closed porosity was created by decomposition of carbonates prior to sintering, thus leaving voids that were not completely filled by the viscous melt. The resulting oxides chemically modified the liquid phase and promoted the crystallization of  $\beta$ -wollastonite, diopside and anorthite. Hence, viscous sintering was affected. The addition of limestone brought on several advantages: the temperature of maximum sintering rate was decreased ( $<900$  °C); the dimensional stability range was extended; the matrix was reinforced by newly-formed crystals that compensated for the global structure weakening evoked by increased

Download English Version:

<https://daneshyari.com/en/article/10155507>

Download Persian Version:

<https://daneshyari.com/article/10155507>

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