



Aalborg Universitet

AALBORG UNIVERSITY
DENMARK

Optimizing the composition of glass particles as supplementary cementitious materials

Moesgaard, Mette; Yue, Yuanzheng

Publication date:
2009

Document Version
Publisher's PDF, also known as Version of record

[Link to publication from Aalborg University](#)

Citation for published version (APA):

Moesgaard, M., & Yue, Y. (2009). *Optimizing the composition of glass particles as supplementary cementitious materials*. Poster presented at 8th Pacific Rim Conference on Ceramic and Glass Technology - 2009 Annual Meeting of the International Commission on Glass, Vancouver, Canada.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal -

Take down policy

If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.

Optimizing the composition of glass particles as supplementary cementitious materials

This work aims at finding the optimal composition of glass particles suitable for partial substitution of cement clinkers. A mass production requires the glass particles to be made from low cost and locally available raw materials, e.g. clay, limestone and sand.

To find the optimal composition, the following steps have been taken. First, systematic investigations are performed on a three component model system ($\text{CaO-Al}_2\text{O}_3\text{-SiO}_2$) with the aim of achieving a glass composition with a high glass forming ability (GFA). By balancing high GFA with low limestone consumption, i.e. to reduce the CO_2 emission from calcination, it is chosen to use the eutectic composition of anorthite-wollastone-tridymite as the primary composition for further studies. Second, this primary composition is targeted using the natural raw materials. It is found that the usage of the natural raw materials enhances both the GFA and the glass workability. To further enhance the production conditions additional minor components (e.g. NaO and CaF_2) are introduced to the batch materials. Finally the potential of the glass particles as supplementary cementitious materials is tested by investigating the reactivity of the glass particles in a saturated Ca(OH)_2 solution.