



Properties of high volume activated kaoline concret

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Abstract

Metakaolin (MTK) is produced by thermal activation of waste kaolin from the English China Clay plc., at a temperature of between 600 - 800°C. It is a mixture of amorphous silica and alumina which reacts rapidly to form stable cementitious compounds, thus refining the micro-structure of concrete and reducing its permeation resistance to the ingress of deleterious ionic species. Not much information is available on the techniques of incorporating high volumes of this material in concrete in spite of the possible advantages.

This paper discusses the result of a study to assess the properties of concrete incorporating high volume replacement of cement by metakaolin. The result shows that using new generation of superplasticisers could allow the MTK content to be increased up to 50% of the cement content. The concrete has lower porosity and higher compressive strength compared to the control concrete mixture.

Key words: metakaolin, cement, concrete mixtures.

Povzetek

Metakaolin nastaja pri termičnem aktiviranju odpadnega kaolina (English China Clay plc.) pri temperaturi med 600 - 800°C. To je mešanica amorfne silicija in aluminija, ki kemično burno reagira v stabilno cementno obliko, s tem preoblikuje mikrostrukturo betona in zmanjšuje njegovo odpornost glede pronicanja škodljivih ionov v kapilare. Na voljo ni veliko informacij glede tehnike uporabe večjih količin materialov iz teh betonov kljub potencialnim prednostim njegove uporabe.

V članku so prikazani rezultati raziskave glede določitve lastnosti betonov z nadomeščanjem cementa z metakaolinom. Rezultati kažejo, da uporaba nove generacije superplastifikatorjev dopušča možnost nadomeščanja cementa z do 50% deležem metakaolina. Takšna betonska mešanica ima manjšo poroznost in dosega višjo tlačno trdnost v primerjavi z kontrolno cementno betonsko mešanico.

Ključne besede: metakaolin, cement, betonska mešanica.