

Comparative Study of Metakaolin and Silica Fume to Prevent Alkali-Silica Reaction in Concrete

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Abstract

This paper presents the results of comparative study of two well-known pozzolanic materials; metakaolin (MK) and silica fume (SF), to control the extent of deleterious alkali-silica reactions in concrete. While Application of pozzolanic materials is known to be beneficial in preventing ASR, few data is available in Iranian concrete practices.

Derived from purified kaolin clay, Metakaolin is a white, amorphous, alumina-silicate which reacts readily with calcium hydroxide and significantly controls ASR. Silica fume would be highly effective in controlling the alkali aggregate reaction due to its high silica content and high surface area.

In this study the effect of different replacement levels of metakaolin and silica fume on ASR potential is investigated by means of accelerated mortar bar test method (AMBT). Results are discussed in a comparative base, from the view points of ASR potential, and the effect of SF and MK to control the reactions.

Keywords: Concrete, Metakaolin, Silica Fume, ASR

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