

The Fifth Article

Number (14) In The List of Total Publications

M.A. Abd-El.Aziz^a, **S. Abd.El.Aleem**^b, Mohamed Heikal^{c,d}, “Coupled effect of elevated temperature and cooling conditions on the properties of ground clay brick mortars”, Slovak Journal of Civil Engineering; 21(4) (2013), pp. 41-50.

^aFaculty of Engineering, Fayoum University, Fayoum, Egypt.

^b**Chemistry Department, Faculty of Science, Fayoum University, Fayoum, Egypt.**

^cChemistry Department, Faculty of Science, Benha University, Benha, Egypt.

^dChemistry Department, College of Science, Al Imam Mohammad Ibn Saud, Islamic University (IMSIU), Riyadh, Saudi Arabia.

Abstract

When a concrete structure is exposed to fire and cooling, some deterioration in its chemical resistivity and mechanical properties takes place. This deterioration can reach a level at which the structure may have to be thoroughly renovated or completely replaced. In this investigation, four types of cement mortars, ground clay bricks (GCB)/sand namely 0/3, 1/2, 2/1 and 3/0, were used. Three different cement contents were used: 350, 400 and 450 kg/m³. All the mortars were prepared and cured in tap water for 3 months and then kept in laboratory atmospheric conditions up to 6 months. The specimens were subjected to elevated temperatures up to 700°C for 3h, and then cooled by three different conditions: water, furnace, and air cooling. The results show that, all the mortars subjected to fire, irrespective of cooling mode, suffered a significant reduction in compressive strength. However, the mortars cooled in air exhibited a relatively higher reduction in compressive strength rather than those water or furnace cooled. The

mortars containing GCB/sand (3/0) and GCB/sand (1/2) exhibited a relatively higher thermal stability than the others.