

SILICA FUME ADITIVATED SPECIAL CONCRETES

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ABSTRACT

The paper shows the constituents and technical properties of low calcium aluminate cement concretes with ultra dispersed mineral powders and different admixtures.

In the heat treatment conditions the refractory low cement concretes easily develop the high mechanical strengths, due of the new mineralogical phases apparitions which have the role in the genesis of a dense and strengthened bonding matrix. But in case of the same type of concretes it is imperatively necessary the development of good strengths in the normal conditions hardening process, too. This goal is achieved by using of a judicious ratio of chemical bond and micronized powders.

Key Words: Cement dosage, admixtures, pH, P_2O_5 / cement ratio

1 INTRODUCTION

The advantages of using classical refractory concretes, as compared to the corresponding burnt shaped products, are: facility of supplies, lower cost, more rapid placement, simple service etc. However, the physical-mechanical characteristics of the classical cement dosage refractory concretes are lower. This inconvenient diminishes the advantages and efficiency of classical refractory concretes use and sometimes may even determine their elimination from certain fields of application.

Therefore, it would be interesting to use refractories having both important benefits of refractory concretes and qualitative properties of bricks.

The large decrease of hydraulic cement dosage is one possible mean to achieve the above mentioned aims. However, in this case, monolithic refractories with unfavourable strength and structure could result.

Under treatment conditions, the refractory ultra low cement concretes easily develop high mechanical strength. This process is a result of new mineralogical phase's apparitions due to reactions between concrete constituents, which have the role of stronger matrix – aggregate ceramic bond and a dense and hard matrix genesis, too.

A low or an ultra low cement dosage characterizes high performance of refractory concretes, which belong to the last generation [1 - 3]. They show a low matrix/aggregate ratio. The proportion decrease of the matrix, followed by the reducing of grain boundary area between aggregate and matrix – if no other additional measures are taken, can determine a low mechanical behaviour of hardened concrete.