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EFFECTS OF MINERAL PRODUCTS AND CURING TIME ON THE BEHAVIOR OF NEW CONCRETE

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ABSTRACT

Cementitious matrices crafted with additions have been studied extensively. However, no rule has not yet been cleared to quantify the effects of such additions, vis-à-vis the performance of mortars, because the mixture of different materials is not a simple task, because of incompatibilities that may exist between different constituents. Moreover, the mixture of materials compatible does not always lead to the same results; interactions (or interactivity) potential may exist between different types of materials. These interactions may occur by synergisms or antagonisms between the components, and are difficult to detect. The objective of this study is to evaluate experimentally the effect of additions on the performance of cement matrices. We studied the impact of four types of additions (limestone fillers, dairy Fournaux high, silica fume, pozzolana) for different rates of substitution on the rheological behavior (influence the type and rate of additions of the flow, density and mechanical behavior (tensile and compression per flexion) for different maturities (1, 3, 7, 14 days), and on the withdrawal.

Keywords: cement, additions, properties, performance, Pouzzolane, dairy Fournaux high, limestone filler, silica fume.

INTRODUCTION

The method of ripening is one of the main factors affecting the development of concrete strength. Concrete exposed to an elevated temperature results in hydration accelerated and a different form of the hydrates formed. This causes an increase in porosity and gain strength at a young age and a relative decline in long-term strength. The use of mineral additives in the manufacture of new concrete has led to concrete stronger and more durable by their low porosity and low hydration heat flux released.

Previous research has shown that the treatment affects the behavior of cementitious materials: cement pastes and concretes with and without conventional additions. For comparison purposes and to demonstrate the influence of the treatment on the complex phenomena that act simultaneously to age in the case of concrete, namely: hydration, autodessiccation, volumetric variations and evolution of this companion experimental mechanical performance was conducted.

RESULTS AND CONCLUSIONS

We made 12 specimens containing 10% silica fume replacement with cement, and these samples will be subjected to different treatments how to determine which is best suited to

determine the guaranteed minimum strength of the mortar. These cures are summarized below:

- Steaming before 24heurs Temperature: 40 ° C
- Steaming after 24heurs Temperature: 40 ° C
- Maintain a water temperature: 23 ° C
- Maintain air temperature: 23 ° C

The rapid evolution of hydration during the first week is of major importance because of its influence on the mechanical properties.

In conclusion, the effect of thermal treatment on the set of physico-mechanical properties is favorable to the young age that the different processes interact are thermally activated at a young age. However, the opposite effect was observed in the long term. This effect is related to low levels of hydration ultimate high temperature over 20 ° C.

The influence of addition varies with its nature, the characterization of cement and maturity measurement, measurement of the addition and finesse are also first order parameters. On a general level, the cement hydration is favored by the presence of a thin mineral with its finesse and determination.

This study sheds light on the influence of mineral admixtures on the rheological and mechanical properties of cement matrices.