International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

http://ijpsat.ijsht-journals.org
Vol. 27 No. 1 Junio 2021, pp.137-141

Determination Of The Gap Between The Gel Coating And Concrete, Taking Into Account The Physical Processes That Occur In The Hardening Of Concrete In Dry Hot Climates

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Abstract – In this article it is giveh the issues of heat processing of concrete in winter and the results of exheriments of the effects of the water cement of the concrete.

Keywords – Heat Treatment, Temperature Gradient, Cement Exotherm, Temperature Rise, Cooling, Temperature Field, Isothermal Exposure, Surface Modulus, Environmental Heat.

I. INTRODUCTION

In the experimental work, a concrete mix was used, taking into account the water-cement ratio. The spread of the concrete mixture on the cone subsidence was 1-3 cm, and the following aggregates were used: portland cement Okhangaron plant brand M400, crushed stone mainly from local plants Aktash quarry plant product, crushed granules 5-20, quartz sand Mkr = 3, 4 at the level of demand. At the time of the experiments, the maximum ambient temperature was 34–36^{0}C and the relative humidity ratio averaged 37–32%.

II. ANALYSIS AND RESULTS

The film coating was left at different distances from the concrete surface, thereby achieving its hermetic coating. During the experiment, one sample was compared across the surface, tightly closed, i.e., for comparison δ=0 mm, the remaining samples without any care (δ=∞) hardened. The link obtained based on the experimental results $j = f(\delta)$ The graph is shown in Figure 1 below. The curve 1 shown here is the amount of water that continuously evaporates from the freshly poured concrete, mainly depending on the thickness of the void layer when it is hermetically sealed. This is the case for (j) concrete, if the sample surface is set in a dense state δ=20-It differs insignificantly at 25mm and averages 0.043 and 0.072 kg / m^2 hours (Fig. 1). An increase in the void layer on the concrete surface leads to the occurrence of continuous evaporation from the concrete. That is, the thickness of the layer δ=60-65 mm j =0,32 kg/m^2 hour, δ=200-205 mm when j=0,44 kg/m^2 hour. It is, in fact, an indicator of continuous evaporation from concrete that hardens in the open j=0,99 kg/m^2 hour will be around. Link to the results: $(\Delta l / l)_{max} = f(j)$ is formed. This amount is as shown in Figure 1 j=0,043 and j=0,072 kg/m^2 hour, a small figure $(\Delta l / l)_{max}$ if you can $j \geq 0{,}32$ kg/m^2 hour These expected data have been confirmed based on the results of their study and experiments on the plastic deposition and continuous evaporation of concrete. δ=0 mm,$(\Delta l / l)_{max}$ =0,2 mm / m and δ=20-25 mm $(\Delta l / l)_{max}$=0,45мм/м we know that (Figure 1).

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Based on the results of the experiment, based on the curve 2 in Figure 2, we can say that δ=0 and the recent water loss rate in hardened concrete at 20-25mm, if the total concrete water content is between 3 and 5.5%, if δ=40-45мм, ΔW/W=17…18% and thus the dehydration rate continues.

Thus, the thickness of the air gap between concrete and helioplasting is tightly closed around the perimeter of the surface, based on the results of experiments, taking into account the physical processes occurring in concrete, we determine that the thickness of the void layer is on average 20-25 mm. To determine this rule, we cast a sample-prism, put it under a 2-layer film coating for a day, changing the thickness of different cavity layers, part of the normally heated room part of the polymer film coating, which is tightly closed with a surface part of the open polygon 28 and during the day we ensured that it hardened in the shop room. As a result, we determined their prism strength.

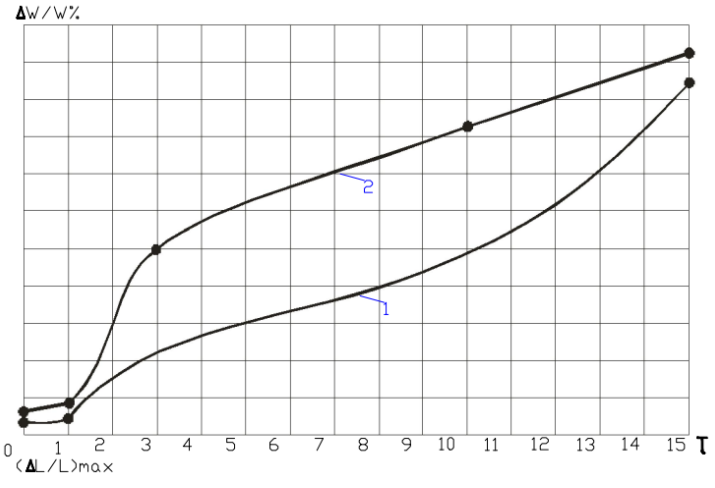

Figure 1. The amount of continuous evaporation in freshly poured concrete is -1; and water loss during recent solidification (ΔW / W)- 2; based on the indicators, a graph showing the dependence of the cavity on the concrete surface on the thickness of the layer

When the evaporation (dehydration) of the concrete is continuous $j \geq 0{,}32$ kg/m^{2}h is a condition, indicating that it continues to sink plastic, with the largest amount being in the range of 1.75-2.77 mm/m. A layer of air space δ=40 - 45мм while continuous evaporation in freshly poured concrete is in the range of the smallest and largest critical values in the transition area, and as a result the maximum plastic subsidence value of the concrete is on average - around 0.8 mm/m. Figure 2 confirms that the “plastic sinking” rate formed by the continuous evaporation of concrete is in direct contact. Based on the data conditions of the experiments, the maximum amount of "plastic sinking" of concrete $j \geq 0{,}32$ We know that there is a slight difference in kg / m^2 per hour.

This is the difference $(\Delta l / l)_{max}$ the figure can be explained as follows: The difference from open concrete samples in direct contact with the environment is that continuous evaporation is directly related to the relative humidity in the environment, i.e., constant with wind speed and air temperature. Therefore, mainly in dry and hot climates, the "plastic sink" side edges of the concrete barrier, the upper part of which is covered with a film coating, due to the effects of two physical processes: thermal expansion due to high temperatures under the film. Characterized by the occurrence of "plastic sinking" processes.

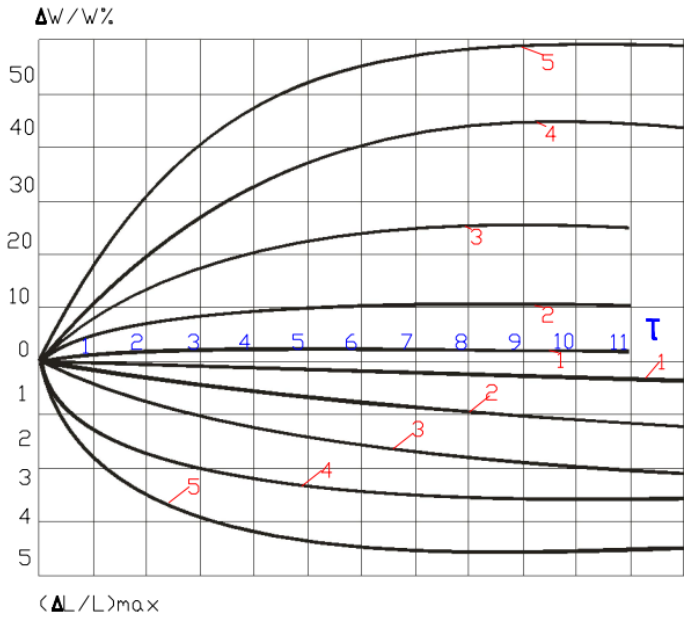

Figure 2. Graph of "plastic settling" and evaporation (dehydration) of freshly poured concrete, which hardens under different conditions.

1. Tightly wrapped through polyethylene film; 2. Two-story δ=20 мм hollow polyethylene coating; 3 Similar, δ=50 мм when; 4. Similarly, δ=205 when mm; 5. In untreated concrete.

The results of temperature measurements under the film coating on the installation of the hollow layer on the concrete surface at different heights (thicknesses) showed that during the stabilization of the "plastic sink", ie every 3-4 hours after the sample is installed for testing, the hollow layer δ=60-65 mm ambient temperature in t=63^{0}C, δ=60-65 mm , t=63^{0}C,δ=500-505 mm t=55^{0}C we know that the indicators have been achieved. Decrease in temperature in the solidification medium, δ- due to the enlargement of the layer, which in turn reduces the thermal expansion of the concrete sample several times. On the other hand, an increase in the void layer in the interval results in continuous evaporation of the concrete to water loss and consequent "plastic subsidence". Therefore, $(\Delta l / l)_{max}$ determined that the ratio is an average of 1.75-2.77 mm / m, if the concrete film hardens under the coating, the thickness of the hollow layer is 60-65mm, 80-85mm, 200-205mm, respectively, and in the hardened concrete under the same conditions without care, they leads to the complete formation of the internal structure, the normative possession of its strength and the violation of other properties.

Thus, the results of the study of the dehydration of concrete - increasing evaporation rate, continuous evaporation, plastic deposition, thermal expansion and its interconnection, the strength of hardened concrete under polymer film in different conditions and different voids - layer thickness show that the concrete surface The thickness of the cavity layer, on average d = 20 ... 25mm, does not significantly affect the internal structure of the physical processes occurring in the initial state of hardening concrete, if it is tightly closed around the concrete surface

Increasing the thickness of the hermetic air gap layer in new concrete hardens, mainly due to the flow of internal physical processes, which in turn leads to structural deterioration, reversal of the formation and, consequently, a decrease in hardening after one month.

In summary, it was confirmed that the creation of a solar cover depends on the thickness of the air gap between the freshly poured concrete surface and the coating, and as a result efficient use of solar energy and several positive approaches can be achieved. Based on the experimental results, the thickness of the cavity layer δ=20...25мм being around, this prevents the negative physical processes that occur in concrete from being stopped, i.e., not occurring. This is basically $(\Delta l / l)_{max}=f(j)$ based on the results of the experiment and the indicators of increasing robustness.

III. Conclusion/Recommendations

The continuous evaporation of water from the concrete surface and, consequently, the occurrence of its 'plastic sinking' depends on the rate of evaporation as well as the binding to water and the degree of solidification, the transition to the crystalline state. The thickness of this layer under production conditions due to the condition that the thermal resistance in the hollow layer increases δ=20...25мм can be obtained. The film heliocoating must ensure that the non-molded part of the hardening concrete is completely hermetically sealed.

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