Manufacturing a Lightweight Concrete by Using Food Waste

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1-Introduction

Today, the use of lightweight concrete in buildings is of increasing importance. Also, the use of environmental friendly materials is also a new approach to engineers. Hence, the research team used natural wastes in concrete. According to this study, three materials of egg skin and walnut and nano-cellulose skin were selected as hardening and lightening, and each was tested as a cement alternative. The egg skin sample had the highest strength compared to other specimens, and even showed a stronger strength, 13%**,** than the control sample. It also showed the lowest density among the samples.

2-Experiments and Results

According to the results, an egg skin sample was selected as the preferred sample. In the second step, the factors such as the size and amount of egg skin, the amount of water and the lightening additives were investigated. Therefore, two sizes of egg skin and under the mesh 200 were used. According to the results, the more particles are finer, the compressive strength and density will increase. In the next step, the percentage of egg replacement was tested instead of cement. Between 7%, 14% and 21% the 7% replacement had the highest compressive strength instead of cement. The third factor was the effect of the amount of water consumed.

The strength of the samples is directly related to the amount of water consumed, so this concrete is usable in curb exposed to rain water.

Also, two natural gum and lightweight E600 (ionolite) were used as a lightner, which reduced the density to 9 to 19 percent, compared with the control sample, but decreased the strength of the specimen due to the formation of air bubbles. Thus, it was concluded that the best example of the 14 specimens was a sample of 7% eggs under the mesh of 200 replaced by cement which 12% of the total mass is formed of water.