

Flashag- New Lightweight Aggregate for High-Strength and Durable Concrete

Obada Kayali¹

¹School of Aerospace, Civil and Mechanical Engineering, University of New South Wales at The Australian Defence Force Academy, Canberra, ACT 2600.

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ABSTRACT

A new type of lightweight aggregates is patented. This type is given the name Flashag. The only solid raw material used to manufacture these aggregates is fly ash. The aggregates are sintered but not pelletised and the process is easy and inexpensive. This paper describes these patented aggregates and compares them with other lightweight and normal-weight aggregates that are used for concrete. The paper presents the results of testing the aggregates for properties important in the concrete industry. The paper further presents the results of testing structural high-strength grade concrete made from the new aggregates. The results show that the concrete made from the new aggregates is lightweight, possesses low porosity, high strength and high durability potential. The results of the new aggregates are far more superior to previously known lightweight aggregates. High strength characteristics using Flashag are easily achievable with only moderate cement content. Even more significant, this new aggregate gave results that are superior to those of normal weight concrete that had the same cement content and comparable workability. The lightweight concrete made using this type of aggregates is more than 21% lighter than normal weight Granite and Dacite aggregate concretes. At the same time, Flashag concrete is about 15% to 21% stronger than high-strength normal weight aggregate concretes. Moreover, Flashag concrete possesses 30 % lower drying shrinkage value than normal weight high strength concrete and thus may be much better in resisting crack formation.

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