UNIVERSITI TEKNOLOGI MARA

UTILIZATION OF USED COOKING OIL AS FOAMING AGENT IN LIGHTWEIGHT FOAMED CONCRETE.

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ABSTRACT

The utilization of used cooking oil (UCO) from waste materials to be a foaming agent (FA) for foamed concrete production. Purposely this study is to promote the use of waste materials become a useful product. As to achieve the target, several aims to be focus and the main objective is to formulate UCO become FA for foamed concrete. After several processes, UCO now available to work as FA and so called formulated used cooking oil foam (FUSCOF). To ensure the integrity of FUSCOF begin a foaming agent, several testing were conducted such as chemical and physical characterization, stability, morphology and mechanical properties. As a result, FUSCOF determined as most stable foam and self-rising foam while comparing with commercial and prove has better foaming agent properties. One of the significance findings is that the formulation of UCO (Used Cooking Oil) to become a forming agent (FA) which used for foamed concrete production which known as FUSCOF. By using chemical instrumentation such as GC-MS and FTIR, the quantitative analysis of UCO contain ethanol, eicosadine, oxirane and Octadec-9-enoic acid. Furthermore, the highest compressive strength attain by FUSCOF when the percentage of foaming agent added to the concrete mixture of 10%. The compressive strength gradually increased starting from 3,7, 14, 28 and 56 days of curing. Therefore , UCO can be used as well panel, floor slabs and roof.

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INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The utilisation of recycled materials is a serious attempt to urge people towards recycling waste materials. Recycle materials encourages by reducing the landfill pressure demands of extraction and to develop an economically and environmentally condition (Panesar, 2013).The usage of recycled materials should act as a good practice in concrete applications. For this purpose, some product may potentially be achieved if the waste products can be fully utilized. Through recycling, varieties of a product may be created and the environmental problems will be solved. This study, will focus on the utilization of used cooking oil (UCO) for making foaming agent (FA) which purposely for civil engineering applications. These intentions are to promote towards sustainable of a construction practice for the concrete application (Huang, Bird, & Heidrich, 2007).

The past decade has seen the huge applications of waste materials in civil engineering technologies. Concrete technology are growing and become significant and interesting scope to be explored. For instances, the introduction of UCO in concrete materials which may lead to the formations a foaming agent. This is because; it is not limited to the basic components such as a binder, aggregate and water (as well-known as conventional concrete) but in some manner it is excessively excited to unveil. The evolution of concrete technology that generally involved with concrete repair, design concrete, recycles concrete, lightweight concrete, partition, insulation and filling grades rapid harden concrete and other (Ramamurthy, Kunhanandan Nambiar, & Indu Siva Ranjani, (2009) and Fu, Yeih, Chang, & Huang (2014).

However, this study is to focus on lightweight foamed concrete (LFC), which known as foamed concrete application. As primary focus points, (LFC) has unique properties and very versatile on it materials as compared with normal concrete. The significant difference of foamed concrete and normal when it was applied with different percentage of foaming agent .Purposely by adding a foaming agent in cement paste is to create pore or voids structure. Pore or voids structure presence will