IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 11, May 2023

Use Rice Husk Ash as Partial Replacement of Cement in Concrete

Supriya Suryawanshi, Aditi Khune, Payal Jadhav, Sneha Suryawanshi, A. A. Avasthi
Pimpri Chinchwad Polytechnic, Pune, Maharashtra, India

Abstract: *In India rice milling produces a by-product which is known as Husk. This husk is used as fuel in rice mills to produced steam for boiling process. This husk contains near about 75 % organic matter and the remaining 25% of this husk is modified into Ash during the firing process which know n as rice husk ash (RHA). The rice husk ash (RHA) contains near about 85 % to 90 % amorphous silica. By using rice husk ash in concrete, we can improve the properties of concrete. The current study and experimental investigation were taken to study the properties of concrete made with Rice husk ash. the replacement is done partially in the proportion of 0% ,20% and its effect on workability of concrete made with rice husk ash were investigated for the 20% rice husk ash replacement, the hardened properties such as compressive strength observed were good as compare to 0 % RHA. The compressive strength test was conducted at 0 % and 20 % rice husk ash replacement and the highest compressive strength at 20 % RHA replacement as compared to 0% RHA replacement at 14 ,21 and 28 days. Rapid increase in construction activities has resulted in shortage of conventional construction materials. In the present scenario, the high cost of conventional building materials is a major factor affecting housing delivery in the world.This has necessitated research into alternative materials of construction. The effective housing techniques deal with reduction in cost of construction as well as providing strength to buildings. Mainly gravel, sand and cement are used in the preparation of conventional concrete. While the use of agricultural by-product i.e., rice husk as a partial replacement with the conventional fine aggregates is expected to serve the purpose of encouraging housing developers in building construction. Rice husk is produced in about 100 million tons per annum in India. Twenty kg of rice husk are obtained from 100 kg of rice. It contains organic substances and 20% inorganic material. Ash from rice is obtained as a result of combustion of rice husk at suitable temperature. Proper utilization of it aims to save the environment, encourages the Government to find solutions regarding disposal to landfills of waste materials, and provides new knowledge to the contractors and developers on how to improve the construction industry by using rice husk, to sustain good product performance and to meet recycling goals.The rice husk ash concrete aims to prepare light weight structural concrete which may reduce considerably the self-load of structures and permits large precast units to be handled. The main objective is therefore to encourage the use of these 'seemingly' waste products as construction materials in low-cost housing.The various basic properties of rice husk concrete are reviewed in this paper.*

Keywords: Concrete, Rice Husk Ash, Compressive Strength, Split Tensile Strength, etc.

REFERENCES

[1] Mehta P.K., "High-performance, high-volume fly ash concrete for sustainable development". Proceeding of the International Workshop on Sustainable Development and Concrete Technology, Beijing, China, May 20-21,2004.
[2] Mehta P.K., "Mineraladmixture for concrete-an overview of recent development" Advances in cementand concrete,ProceedingofanEngineeringFoundationConference,UniversityofNewham shire,ASCE,pp-243-256,1994.
[3] A.Ramezanianpour, F.Gafarpour, M.H.Majedi., The use of rice husk ash in building industry. Building and HousingResearch Centre(BHRC),winter 1995.
[4] A.Ramezanianpour,G.Bina,H.Rahimi"Theroleofricehuskashin productionof lightweightstructural panels", Proceeding 3rd International Conference on Concrete, May 2000 Teheran, Iran.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 11, May 2023

[5] P.K. Mehta, P.JM Montero, Concrete, Microstructure, Properties andMaterial, Translated into Persian by A.Ramezanianpour, P.Ghoddousi, E.Ganjian, Amirkabir University of Technology Press, summer 2004.

[6] A.A.Ramezanianpour,A.M.Ramezanianpour,Chloridediffusioninsilicafumeconcretemixture", International Symposium on Concrete, Toronto,Canada,17 October 2005.

[7] M.Nehdi,J.Duquette,A.EIDamatty,"Performanceofricehuskproducedusinganewtechnologyasa mineral admixture in concrete", Cement andConcrete Research(2003) PP.1203-1210.

[8] M.Zhang, V.M. Malhotra, "High-Performance Concrete Incorporation Rice Husk Ash as a Supplementary Cementing Material", ACI Material Journal, November-December1996, Title no:93-M72,PP.629-636.

[9] Bui D D, Hu J and Stroeven P 2005 Particle size effect on the strength ofrice husk ash blended gap-graded Portland cement concrete Cement & Concrete Composites 27 pp. 357– 366.

[10] Ganesan K, Rajagopal K and Thangavel K 2008 Rice husk ash blended cement: Assessment of optimal level of replacement for strength and permeability properties of concrete Construction and Building Materials 22 pp. 1675–1683.

[11] Gemma Rodriguez de Sensale 2006 Strength development of concrete with rice husk ash Cement & Concrete Composites 28 pp. 158-160.

[12] Hwang Chao-Lung, Bui Le Anh-Tuan and Chen Chun-Tsun 2011 Effect of rice husk ash on the strength and durability characteristics of concrete Construction and Building Materials 25 pp. 3768–72.

[13] Ravande K, Bhikshma V and Jeevana Prakash P 2011 Proc. Twelfth EastAsia-Pacific Conf. on Structural Engineering and Construction —EASEC12 vol 14 Study on strength characteristics of high strength rice husk ash concrete Procedia Engineering pp. 2666–72.